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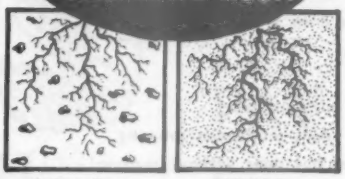

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Organic Gardening

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COVER FOR JULY

The Cover is a color reproduction of a beautiful Glass Enclosure designed by LORD & BURNHAM, Irvington-on-Hudson, New York. In the design are Lombardy poplar trees in the background, vining plants on the trellis and house, and flowers and flower girl in the foreground.

Courtesy of Lord & Burnham

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DR. WILLIAM H. EYSTER, *Managing Editor* — KARL MANAHAN, *Art Director*
WILLIAM ACKERMAN, MS., *Associate Editor* — ANN ANDREWS, *Flower Arrangement Editor*

Published monthly by ORGANIC GARDENING. Publication, Executive, Editorial and Subscription Offices: 6th and Minor Streets, Emmaus, Pa. Advertising Offices: 46 S. West St., Allentown, Pa. Subscription Rates, United States and Possessions. One Year $3.00, Two Years $5.00, Three Years $6.00. Unless otherwise directed all subscriptions begin with the current issue. Renewal subscriptions begin immediately after old subscription expires. When changing an address, give the old address as well as the new. Manuscripts should be accompanied by full return postage and a self-addressed envelope. Printed in the United States of America.

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Entered as second class matter January 27, 1943, at the Post Office at Emmaus, Pa. : under the Act of March 3, 1879.

THE FORUM

Crop Failure Remedied with Compost

We have been sold for some years on the organic method. We came here two years ago and obtained possession of a three-acre pasture lot of pure sand—layer after layer of different colors but no sign of clay and very little gravel. Hillsides adjoining our lot have plenty of the latter. In our first year we dug up a small garden space, and planted various vegetable seeds. Among others we planted about a peck of potatoes. Declining to use commercial fertilizers, we had nothing to feed them. Harvested altogether about a peck. We set out 48 tomato plants; only one survived, and it produced exactly one tomato. Sweet corn and beans didn't even give us a mess. We had plenty of material for compost in the leaves of a nearby wood lot, and we managed to accumulate about a ton that summer.

Last season, with the aid of this small amount of compost, and in spite of a prolonged dry spell in midsummer, results were quite different. Potatoes were sufficient for winter for the two of us; tomatoes on the same lot as the previous year, although a bit late on account of late spring frosts which prevented early transplanting, set plenty of fruit for table use and canning; sweet corn, snap and lima beans turned out a fine crop.

We will have more compost next season, and feel sure we shall extend the variety and quantity of our garden produce. Age and lack of finance are the only handicaps facing two enthusiastic organic experimenters.

Ben H. Williams
R.F.D. 1, Box 7B, Rapid City, Mich.

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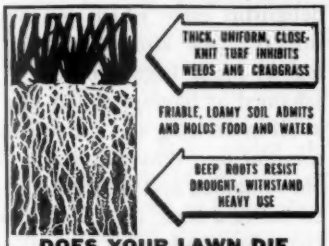
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Nature's Methods Will Prevail

I am wholeheartedly in favor of the overall concept of organic gardening; but sometimes, after reading several of Mr. Rodale's learned essays, I find myself confused as to the details, not to say contradictions.

I wonder at all this interest in shredding of leaves, and chopping up of garbage, to hasten the action in the compost pile. My idea is that gardening is an avocation of leisure; one in which we take nature by the hand and walk along with her, rather than hastening to force her.

"Hedgerow Horticulture" in your January issue, by Jeanne Pontius Rindge (fascinating name that) is a delightful essay which touches this subject. But after reading it, my logical mind began to feel a little ashamed at having wasted any time at all in weeding and cultivating and composting. Why not throw a few old tomatoes, and a handful of golden bantam corn, into Miss Rindge's charming hedgerow and then go home and wait until harvest-time.

I have a little garden of about 40 by 80 in which I am always running two compost heaps. Both are right in the garden, so that leaching will go into the ground, which is where I want it. One of these heaps gets everything as it comes—leaves, cornstalks, grass, scythings and garbage. In the fall I buy a load or two of manure and mix it with this primarily broken down heap, in preparation for use in the spring. Then I start another heap of the rough stuff in a new part of the garden. This sounds rather easy and inefficient compared to all the descriptions I am reading—but that's the way I am doing it.

My ambition is to have everything I raise of such frightening vigor that the mere sight of them will scare away any prowling insects or fungi; but that may take time, and in the meanwhile I may use (not commercial fertilizer, not over my dead body) some insecticide. A neighbor has told me of successfully using paper bags on his grapes to keep them from turning to mummies; but to protect a dwarf apple tree I have ordered for the spring, from the codling moth, and the beans from the beetles, is a different matter.

William Raoul,
Navesink, New Jersey

Editor's Note. *There can be no objection to hastening Nature providing we go Her way. Only such plants will prosper in the hedgerow that find there favorable growth conditions. Tomatoes and corn are definitely not hedgerow plants. When your soil has been completely remineralized and sufficiently enriched with humus, you will need no insecticides.*

—o—

Control of Moles

I have read your magazine with much interest for the past two or three years and enjoy it very much. Recently I was elected president of The Biological Soil Builders Club of Auburn, Washington. I have had some interesting experiences with the use of compost on my garden in the last year. Especially was I much surprised at the results I got from my potatoes that were grown with compost. I have tubers that weigh as much as two pounds apiece and are free of scab and other disease. But I must tell of the success I have had in dealing with the problem of moles in the garden and lawn. I have found a system that is sure-fire to get rid of the pests and it is not an expensive one either. It is as follows:—Where moles are working I take a garden rake and rake all the mounds flat in the plot where pests are to be eliminated. Then I wait until the following morning. I get up early, and I say the earlier the better, in fact as soon as it is light enough to see well. Then the new mole hills thrown up during the night are treated in the following manner: with your hand, carefully remove the dirt thrown up and open the hole to the mole runway beneath being careful not to allow the dirt to fall in, then take about a half-cup of gasoline and pour in the open runway, then make a ball of the moist earth large enough to plug the hole.

Then take the balance of the dirt and cover the top, patting it down firmly so none of the fumes can escape. Do this to every mound thrown up the first night. Repeat the operation a few mornings in succession and the results are amazing. The fumes from the gasoline choke them to death in their runways and that is the reason for doing it early in the morning as the moles are still in the runways and have not returned to their nests where they sleep during the daytime.

My lawn was so infested with them last spring when I started the treatment that it was necessary to take a shovel and load up the dirt piles before I could mow the lawn, and many a time I hauled away a couple of wheelbarrow loads of dirt first before mowing the lawn.

This system of control works equally as well in your garden as I had good experience last spring and summer. After you see that the hills thrown up decrease do not let up on the treatment but patiently keep after them and in a few days they are gone. I have dug up dead moles in the runways only a little way from where the gasoline was poured in.

I have a twenty-eight acre ranch here in western Washington and have a modern dairy and eventually I am going to apply the system of Organiculture to the whole ranch.

Archie F. Churchill,
R. F. D. No. 1, Box 763,
Auburn, Washington

—o—

Compost Solves Nursery Problems

I would like to write a story of the miracles that have taken place, since I wrote you nearly three years ago, to tell you how I managed to keep strawberries alive througout our hot summer and how I successfully raised several African Violets, through composting.

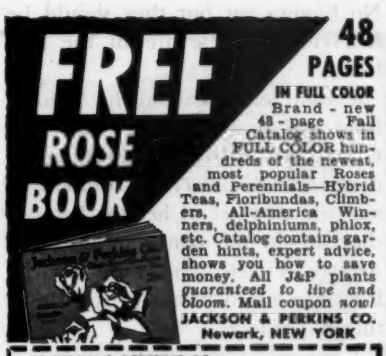
I am reminded as I look over my neat fine appearing plots of plants of the pitiful day, three and one-half years ago when I stood looking at my poor, dying, worm-chewed efforts, and gave up gardening in Florida.

That was the day I said, "Well, God, I have tried and tried but I guess you just aren't going to give me a break, so I give up." That was the day I listlessly opened a flower magazine and read your advertisement. Answer to a prayer? It seemed so. I had certainly been receiving that book all along and I never had noticed your ad, or at least never paid any attention to it.

Well now I am in the florist business and doing fine. We still have a long way to go but I know, at least, we are on the right track.

You see, our land was high and dry and pure sand. So this year we dug out our beds, and put in a thick layer of river grass, ours for the taking and oh, such marvelous stuff. You should see the roots go for it and such roots! Each bed has received about 1 ½ inch of compost this fall. Last fall we did the same thing. The new beds, added this year are good but the two-year old beds are much better, so I look ahead with confidence for the future, with compost, and believe me, Sir, we did start with nothing. You should have seen the zinnias and marigolds last summer and the snaps, pansies and lily plants this year. Asters are a disappointment because they did not grow tall, but wait till next fall. In the greenhouse and on the slat house benches, results are wonderful. Where did the earthworms come from? I don't know but they came. Both houses are about two years old.

Such African Violets! Leaves fall off onto the compost, in which the pots are bedded and grow into plants, unaided, and the Gerbera beds. Honestly I am sincere when I say women who see them just go into trances. Such colors, such size! And the county agent, as well, as the State inspector said I could not grow them because of nematodes. The plants are one year old and some have seven crowns and as many blooms at one time. They are multiplying so fast I have sold several hundred and am thinking of putting an ad in your magazine. I could rave on about the calla lilies. Plants three feet tall, leaves nine inches across.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No blooms yet but they should be marvelous. These are in the hothouse.

I could tell you about the Amazon lilies we grow and the Gloriosas, Gloxinias and hybrid orchids, while these orchids aren't in compost, I am sure they are so healthy because they are in the same house as the African Violets, and must benefit from the air therein. Do you think this is possible?

I am still experimenting. Camellias do not suit me yet, nor Azaleas. In fact I am only getting started with nursery stock. Roses have baffled me but this year bushes were planted in beds in which marl and river grass were mixed and then compost mixed with the replaced soil. Would you like to know how they made out?

Mrs. Pearl O. Partelow, Mgr.,
Naborhood Florists,
602 Palm St., Titusville, Fla.

—o—

Value of Green Mulches

I think you have hit on something really practical when you suggest using green mulches. I have always followed that plan. That is particularly important with tomatoes. One walks through the rows almost daily. That packs the soil and makes the paths impervious to water and it runs off. Using a heavy mulch the soil is loose and moist. The mulch when the season ends is broken and shredded and is easily plowed under. My tomatoes continue bearing until the late frost.

Farm soil needs much fertilizer. It is impractical to think of compost for an entire farm. If farmers will conserve the corn stalks and stubble and other remnants of the growing crops they will have a moderate supply. I have seen farmers rake up the corn stalks and burn them. It is better to go over the ground with a roller cutter and plow the stalks in. We know when corn is cut for fodder, the ground is often used for rye or wheat. The stalks in fragments are left on the ground. They will slowly decompose and feed the soil.

I never permit a weed to go to seed on my ground. Before the seed pods form I cut them and use them for mulch. In compost the seed being heated are destroyed.

You know all this. Yet one likes to talk with those who have helped him.

Charles Ransford,
Methodist Minister,
Shelbina, Mo.

—o—

Drainage of Soil is Essential

I have used no chemicals on my garden for the past two years and already, with compost, I have raised the largest carrots, sweet potatoes, cantaloupes, and cucumbers that have been raised on that land in the last forty years. This was in locations where natural drainage prevented the soil from remaining wet after rains. But during the last three years, above average rainfall has cut down the overall average because in the lower spots, the rain water does not drain through fast enough.

H. G. Albery
474 Wilson Ave.,
Columbus, Ohio

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Use Compost Pit as a Hotbed

Why not let the compost pile furnish heat for the hotbed? That's just what I did last spring and had the best luck I've ever had. Looked as though every seed germinated, grew like weeds and made husky plants. Had no plant disease and no sign of damping off showed up in any of the flats. The fumes and heat thrown off by the compost pile evidently discouraged the growth of the deadly fungi that plague so many gardeners.

I built a sloping cold frame and placed it on top of the compost pile that was still giving off considerable heat. For flats I used peach boxes filled with suitable soil and a small amount of fine compost. After planting the flats place each one inside the cold frame directly on top of the compost pile. Leave a small space around each box so as to let the excess heat escape into upper part of frame and produce a summer like atmosphere. This space is also useful to pour water through on to compost pile in case it should want to sag.

Better play safe and drive four or five tall stakes around the edge of the compost pile and string up a five or six foot poultry netting. If you don't, then be prepared to find that some dog, cat or chicken has wrecked your playhouse.

The plants must be watched closely, watered regularly and be uncovered on warm and sunny days. Occasionally add compost to the water and pour around the plants to give them an extra boost. At the same time add a little milk for the tomato plants and advance the ripening date of the fruit.

I don't plow my garden. A cover crop is grown during the winter and the compost added just before disking. Then I tear the ground up with a seven foot Ford tiller to a depth of sixteen to eighteen inches. Our soil is a tight clay and under the above treatment our garden bears heavily and is rank in growth.

Asa S. Keller,
911 So. River Rd.,
Cottage Grove, Oregon

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Orlando Jones Garden

AN EXAMPLE of an oval town garden designed in contrast to the usual square or rectangular layout. The bush box hedges, corner seats and crape-myrtle accents should be noted. The off-center paper mulberry is used to provide summer shade.

The raised terrace at the south is a feature commonly found in early gardens especially where there is a parterre design.

The kitchen and its outbuildings are located between house and pleasure garden off a small yard canopied in live oaks.

The kitchen garden in this design is placed parallel to and in close relationship with the pleasure garden.

The following trees and shrubs should be noted in the garden.

Broussonetia papyrifera —Paper Mulberry

This tree was introduced about 1750 by the early settlers expecting to build up a silk industry. The silkworm however fed upon the red mulberry and therefore the silk industry was doomed. This paper mulberry is a rapid grower, late to leave out in the spring and among the first to drop its leaves in the autumn.

Trees and shrubs used in this planting are the following:

Lagerstroemia indica	Crape-myrtle
Buxus sempervirens	Common Box, —Truetree
Cornus florida	Flowering Dogwood
Ilex vomitoria	Yaupon (Hedge)
Persea borbonia	Redbay Persea
Quercus virginiana	Live Oak

Flower Arrangement For July

By ANN ANDREWS

EARLY flower paintings of the 16th Century are the trail blazers for flower arrangements. These paintings were done by men, with the idea of good composition and a pleasing picture to boot. Most of them included moths, flies, caterpillars and shells.

Shells have relative or complementary colors and, for that reason, they are always popular. In making arrangements, any kind of flower except the real heavy ones may be used. For miniature flowers, use small shells. Crown shells used as vases may serve as an added attraction. This organically grown gladiolus of deep salmon color arranged gracefully in the shell of Zancus, or Land Conche, received merit in a competition of the Homecrafters' Show.

Arranged by Mrs. Wilbur H. Deibert,

Emmaus, Pa.

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FOR COMPOSTING

You can—instead of being a destroyer by use of artificials—help Nature in replacing the elements she has given up by composting waste materials such as leaves, grass-clippings, weeds, etc. Earthworms play an integral part in converting waste into valuable manure. Have them help YOU to help Nature in providing for YOU and YOURS.

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(Dept. J L.)

WITH THE EDITOR

MULCHES

By J. I. Rodale

ABOUT April 15th we made our decision regarding what to do with the mulch that had lain on our vegetable patch since last October. We plowed it under as shallow as the plow would permit. It was far from being decayed. Much decomposition had been accomplished at the bottom of the mulch. The material was greatly darkened and softened. There was no fear that the thrusting of so much raw organic matter upon the microorganisms of the soils would create a nitrogen deficiency because, to start with, our soil was so fertile. Those who start with an infertile soil, or a soil that has just come from the chemical method, would do well to pull the mulch away, plant and then return the mulch.

As it was, our soil had the benefit of a protective, warming mulch all winter, which no doubt helped to multiply the soil organisms and the earthworms. From an examination of the soil, we are completely satisfied thus far. It looks much darker and of better tilth than in previous years when we went to the trouble of making compost and applying it. I have never applied so much organic matter to one piece of ground. When we used to make compost, there never seemed to be enough to go around. Now with the application of a new heavy mulch as soon as the plants start growing, and leaving it as a cover over next winter we know that there will not be a lack of organic matter.

Mulching Increases Potassium

There is extensive literature to indicate that there is production of potassium under a mulch. In one test a type of mulch which was low in potassium was used on a soil in which the potassium tested low. After the elapse of a period of time, the soil tested much higher in potash, much more than would be warranted by the amount of potash in the plant material of the mulch. Evidently the leaching down into the soil of liquids obtained from the mulch furnished something that worked on the insoluble potash in the soil and made some of it available. Carbon dioxide given off in plant matter decay may have been a factor. When compost is made, large amounts of carbon dioxide are given off and lost into the atmosphere. I am going to talk more and more from time to time on the dynamic quality of organic matter placed directly on the soil. It does many things of value to the soil when the process of decay takes place in or over it.

Here is another bit of evidence that mulches increase potassium. I quote from the Jan., 1950, *American Fruit Grower*: "At Purdue University (Indiana) Clarence E. Baker found that mulching with manure, straw and soybean hay eliminated symptoms of potassium deficiency in a peach orchard. Check trees, which received no mulch, did not recover.

Mulches Increase Yield

Here is an item from *Successful Farming* (Feb., 1950) which shows another advantage in mulching:

Do you often get a big apple crop one year and none the next? Well, here's a tip! The Indiana Agricultural Experiment Station says mulched apple trees tend to bear annually instead of every other year. The trees bloom moderately. There's a fairly good fruit set every year.

Reporting on a continuing experiment, the Indiana research workers state that their Grimes trees, in sod and mulched, have been leaders in production. The mulch used was a mixture of straw, shavings, and manure. Strawy manure would probably work quite well if it is kept in a loose condition.—*Don L. Helt.*

Channing Cope in the March 23 issue of the *Atlanta Constitution* says: "The Experiment Station at Watkinsville has discovered mulching is a better land building practice than is the plowing under of green manures. Perhaps these practices are not regarded as composting by the organic farmers, but they are steps in the right direction. We still need fertilizers with most of these practices, but as we increase the humus content of our soils we move closer

to the day when we need less fertilizers—perhaps none at all." Bully for you, Mr. Cope.

Another Example

Here is another example of splendid results obtained from mulch gardening, and I am going to reprint the entire item, which was written by Carrow de Vries and published in the Ligonier, Ind., *Banner* of March 9. Indiana seems to be partial to mulching. The article is entitled: "Mr. Koester's Wonderful Garden."

"When I lived in Detroit, my father-in-law came to see me often, especially in the summer, and on each visit had something new to tell me concerning Mr. Koester's wonderful garden on Morrison Island on Lake Wawasee, Indiana.

"Now my father-in-law is given to exaggeration. He calls it optimism and thinks it a good thing. So when he told me Mr. Koester had tomato plants ten feet high and loaded with fruit, I cut it to five feet and even doubted that, somewhat. When he told me, on another trip, that Mr. Koester had eggplants as large as a big muskmelon I cut it to half and believed that. But when he told me that Mr. Koester didn't use chemical fertilizers and didn't spray, I knew my father-in-law had gone far beyond optimism and was just plain lying. I knew that because I was trying to raise a Victory garden and spent a lot of money on chemical fertilizers and sprays.

"A few years later, I moved near to Ligonier and had a chance to see his garden grow. To my astonishment, I saw my father-in-law had not needed to exaggerate. Mr. Koester actually did raise such wonderful vegetables.

"One day he told me how it all came about. He reads a lot of magazines, and having an inquiring mind, is always in search of new ones. Mr. Koester glanced through a magazine on organic farming and said, 'Nobody can tell me you can raise decent vegetables without using chemical fertilizers and spraying.'

"He had been a chemical fertilizer man for years. He even mixed the stuff into his soil with his hands. But something about the magazine made him pick it up again and in the end he decided to give it a trial.

"He sheet-composted three inches of well-rotted cow manure for three years. Once during that time, he applied phosphate rock at the rate of eight to ten pounds per one hundred square feet. He mulched two seasons and turned the residue under in the Fall, but gave it up as it left him with no weeding to do. The results he obtained are unbelievable.

"His garden plot is enclosed by a rabbit fence. (Rabbits have a special liking for his vegetables.) The windbreak is of Kentucky Wonder beans and I have never seen so many pods, so long and so tender. They vary between nine and twelve inches in length.

"Next to the windbreak are wax and green beans. The foliage is heavy, the pods abundant, and seven to eight inches long.

"The foliage on the limas is thick, the pods plentiful, the beans tender and delicious. In fact, the best I have ever eaten.

"Then comes the tomatoes, ten feet high, two stems per plant having trusses of from nine to fifteen tomatoes.

"Then in succession eggplant, beets, swiss chard, and broccoli. Yes, eggplants as big as large muskmelons, and broccoli as big around as a dinner plate.

"About a third of the garden is devoted to flowers. And a lovely sight it is. Many are the cars that drive slowly by to enjoy it all."

(*Editor's Note*: Controversy over the relative merits of organic farming is gaining momentum in these days of scientific gardening. We invite factual articles on this subject, pro or con.)

This speaks for itself. Mr. Koester obtained these results by mulching—not composting.

Knapp and Knapp

Here is a letter, printed belatedly, for it was sent to us Jan. 31, 1950, but it should take its place in our continuing discussion on composting versus mulching and applying the organic matter direct to the soil:

Dear Mr. Rodale:

You are to be congratulated upon turning over to the natural method of working the organic matter into the top of the soil to compost there with the soil. But tread softly about it being a new method—and untried—for it is not new at all, nor untried.

It is the old, old method used by Mother Nature up through the ages. It has been used for ages by mankind on a wide scale over most of the cultivated world. It is essentially the method set forth in *Plowman's Folly* by Faulkner; and it is specifically what we have advertised in your magazine for more than a year; and sent literature to you personally on, and literature to your advertising department. People—I think in every state—have used it successfully in the form of our Super-Compost. Numerous farmers over the country have been advised how to use the method, as Super-Compost came too high-priced to be practically used on a farm-sized scale. And I have preached and outlined the method in various lectures. Also, some thousands of persons have read the method in our literature.

A lot of those folks must smile—as I do—when you talk about it being a new method and untried.—But that is alright. A little smile is good for every one.—The important thing is that you came out for the method. That is good; and as it ought to be. It is the one and only fundamentally sound method.

I am sending you another copy of our 1949 circular on Super-Compost, so that you may see afresh that we did put forth the method to the fullest extent that we dared at that time. In fact, I went farther than was good business; for you people were preaching against the method. And your reader's were largely following you, instead of us. But now, they are following you and us too.

There is much that I could tell

you on this subject, but this is enough for now.

Yours for the Natural Organic Way,

J. Smith Knapp,
988 Lewelling Blvd.,
San Lorenzo, Calif.

Mulches—Some Facts

Mulching will be new for most of our readers and by our working with them they will learn many interesting things which we hope they will share with other readers of this magazine. Let me mention one or two facts. Mulching may sometimes prove dangerous in the early season when there is risk of freezing. At such a time the mulch increases the warmth under it and if the weather turns too cold, the upper part of the plant may freeze. This has been found to happen often in England where they try for a long growing season. Where there is such a question, if there is a mulch on the ground, rake it aside into piles, but be sure to keep these piles on unplanted portions of the patch so that liquid leachings from them will be preserved in soil where planting is done. Where new mulch material is accumulated, make piles of it, if possible, right in the vegetable garden, for the same reason. If it is a dry year or a dry region, water should be applied to the laying mulch.

One of our readers, Vernon Ward, of North Carolina had an interesting experience in pre-mulching tomatoes. First he plowed and harrowed, then he mulched the ground with about six to eight inches of wheat straw. Then, using Rutgers plants, he set his tomato plants through the mulch at a distance of four feet apart each way. To set the plants he pulled the mulch apart and set the roots in the prepared ground, then pushed the mulch back together around the stems. This was the end of his work. He did nothing else the entire season but pick tomatoes. Dark green vines soon completely covered and obliterated the mulch. No weeds grew. There was an immense set of fine tomatoes which remained large, with hardly any culls throughout the growing season, and the vines were still full of tomatoes at frost. Due to the fact that the fruit rested on the straw mulch, there was hardly any rotting at any time during the season.

An Experience in India

In a book called *Out in the Midday Sun,* by Monica Martin (Little Brown and Co.), the author gives an experience with her garden. She says:

"In friendly rivalry with other gardeners, I grew sweet peas with as many as eight blossoms on one stalk, and in such abundance friends decided I was cheating. They looked to see if some of the sweet pea flowers had been stuck on with glue. I have planted potatoes the size of plovers' eggs and dug up their crop, many of which weighed two and a half pounds each. From October to the following April not one single insect nibbled the cauliflowers, cabbages, potatoes, and sweet corn that all grew in a mad scramble to see which could be the biggest. The cabbages, great white heart drumheads, and the cauliflowers were a size I have never seen anywhere else, and with never a nibbled leaf or a crumpled blossom. In winter the only enemy of the roses was the white ant. He had to be watched. A periodic opening of the roots to sun sent him scurrying away.

"We did not need expensive fertilizers because the best soil enricher was there for the taking. At the beginning of the hot weather horse and cow manure was carted from the stables and turned into the garden. At that time the flowers and vegetables were finished. The manure mixed with the soil for six months and the results were spectacular."

Her method is what we advocate as the "new method." Note that she applied the manure right after the previous growing season was over. She worked the manure into the soil and gave it six months to decay before the next planting season began. There were no losses due to the rains washing out valuable substances, for in her case, the washings stayed in the soil where the plants were to be grown and not on some unused site of a compost heap. What is also important was that the decomposition was a cold decay as nature always uses in her composting, not the high heat of a compost heap which oxidizes out valuable nutrients, bacteria and enzymes. The lady thus obtained spectacular results.

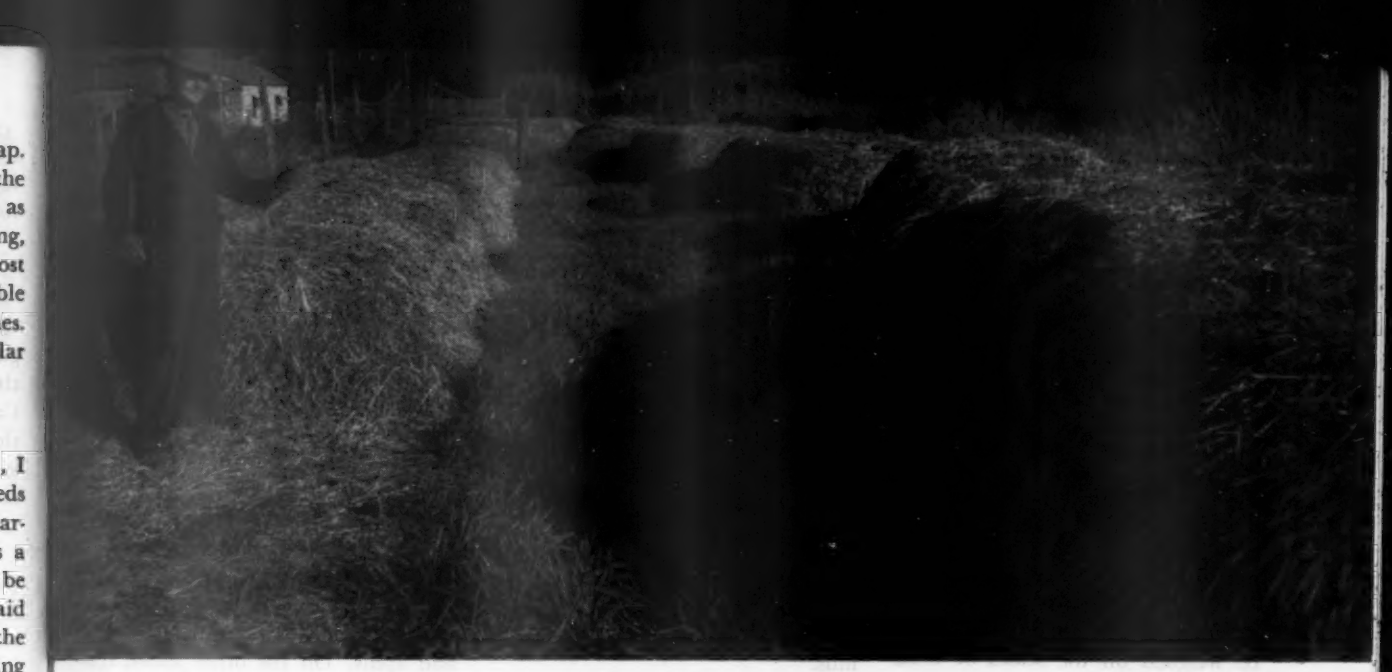
Seeds as Fertilizer in the New Organic Method

In the Dec. 1949 issue, page 21, I projected the idea of using seeds such as beans, soybeans, wheat, barley, oats, sunflower seeds, etc.—as a fertilizer. They would have to be finely ground up, however. I said that they should be applied to the soil about two weeks before planting time. I meant two months instead of two weeks. A hundred pounds of ground whole wheat can be purchased for about $3.00 and it can be mixed in with your mulch material. Thus it can be applied immediately to a soil and not dug in. At many feed dealers' establishments there are bags of spoiled seed that may be obtained at salvage prices.

Another application of using ground up seed as a fertilizer is to put it in water and let it soak for a few days, then to filter out all the water and use as a fertilizer. I believe this seed-water could be used effectively as an application to growing flowers or other plants.

Tomato Juice as a Fertilizer

In a test-tube experiment done by Dr. J. P. Nitsch, a biologist of the Calif. Inst. of Technology at Pasadena, he grew tomatoes with chemicals, but he obtained better results when he added tomato juice either from green or ripe tomatoes. He found that the tomato likes tomato juice. It has been known for a long time that the tomato plant thrives on its own residues used as a fertilizer, so that the use of tomato juice applied under growing tomatoes may be a wonderful, natural stimulant. Readers might apply it under alternate plants and see if they notice a difference. The juice should be put in a larger amount of water for ease of application.



COMPOST IN THE MAKING H. C. White

David Phillips, Yakima Pear Grower, proudly exhibits twelve 9-ton Compost Heaps, on his farm on the Lower Natches River. His three acres of Bartletts will receive a 100-ton dressing—almost thirty-five tons to the acre! The over-all cost of this super-quality fertilizer and soil conditioner, according to Phillips' records, was $5.65 per ton.

WHAT'S WRONG WITH GRACIE?

Raw manure is no substitute for compost.

By HERBERT CLARENCE WHITE

EVERY time I visit my younger sister, Grace, we argue over the odoriferous and perhaps slightly indelicate subject of MANURE. We both are agreed that artificial chemical fertilizers are OUT as far as our respective gardens are concerned. We both decry the use of poisonous dusts and sprays. We are both Organic Gardeners in the broad sense of the term.

But when it comes to MANURE, we are still as far apart as the poles! For, as you all know, I am a confirmed "composter"—while Grace is a devotee of the manure pile, or heap, or bag. And the strange part of it all is, nobody can show me a prettier garden! The rest of the family, as well as the neighbors have always conceded that Grace has a "green thumb." Her garden is consistently beautiful and productive year after year, regardless of the type of soil, or its geographical location.

Could it be that this thing called COMPOSTING is simply a myth, or a figment of Sir Albert Howard's over-wrought imagination? Could Grace be right when she says, "Herbie, my boy, you're wasting your time building compost heaps! Just get a load of manure and stick it on! Why go through all this rigamarole and hocus-pocus connected with composting?"

And me? What can I do to gainsay my sister's seemingly irrefutable arguments and the shining demonstration of a highly successful garden? Is it possible that I and my illustrious "tutors" are *wrong* and sister Grace is *right*? It's all a bit confusing, I'll confess. And whenever I become confused, I just stop arguing and go back to Nature. In other words, when I become tongue-tied I let NATURE SPEAK.

A Study in "Cow Sense"

In my week-end classes in Biological Soil Building, I often point out to my students the interesting fact that cattle in a pasture will consistently avoid the luxuriant growth of weeds and grass surrounding the "cow-pat," while they will crop to the very roots that portion of the pasture that has not been "stimulated" by the fresh undecomposed manures.

At the same time, we humans—with our apparently less delicate taste sensibilities—will eat and relish the resplendent vegetables and greenstuffs that have been stimulated by these very same undecomposed manures! The humble, uneducated cow seems to detect that something is

wrong. Perhaps there is, as Sir Albert Howard says, an "imbalance" in the cell structure of such a plant, which the cow recognizes, while MAN, with all his vaunted wisdom and knowledge, remains utterly oblivious to it all. I sometimes exclaim to my students, "O for a little cow-sense!" Gracie, perhaps could use a little of it too!

That Thing Called "QUALITY"

Is it possible that composted materials contain rare, indefinable qualities that ordinary, raw manures do not possess? Sir Albert Howard has always maintained that QUALITY in foods is something that cannot be weighed on the scales or measured by any known process of the laboratory. But, nevertheless, according to good authority—it is there! Could not the same be true in the field of Organic fertilizers?

Dr. Josiah Van Fleet Makes Compost

On this important point, may I bring to the attention of our *Organic Gardening* readers the pith of a conversation between the late Roger Smith and his good friend, Dr. Josiah Van Fleet, one of New York's nationally-known specialists in nervous disorders. The purpose of Roger Smith's visit was to find out what value the garden may have in some of its more obscure aspects. In response to Roger's question, "Doctor, why do you grow a garden?", Van Fleet replied:

"I grow all my own vegetables myself. I don't have to use the stuff in the stores. As you know, *I use only composted materials for fertilizer.* I do this because I suspect the increasing deficiency of minerals in ordinary food-stuffs is the real reason why the average American is rapidly on the way to becoming a 4-F person. In only a few generations we've slipped physically, and how!"

And may I suggest right here, that if composting, with all its "blood, sweat and tears," is just a silly notion, an unnecessary form of exercise, with a lot of wasted motion, as Grace says, why would highly successful and busy Dr. Van Fleet spend so much of his precious time and strength building compost heaps for his own personal garden over on Long Island? Why doesn't *he* just "toss on the manure," and let it go at that?

Manure Doesn't—Compost Does

Before I forget it, allow me to tell the simple story of our visit to Mrs. Frederick Griggs' garden in Los Angeles. What we saw in this garden may throw an additional ray of light anent our current discussion of "Raw Manures vs. Compost Humus."

Mrs. Griggs lives on the summit of one of Los Angeles' beautiful bare hills (so unlike woodsy, pine-clad Paradise). Fortunately a big water-tank stands nearby, so there is no water-shortage in the Griggs garden. But in spite of an abundance of water, all was not well. Our attention was attracted to a small bush-type Meyer lemon tree. The leaves were small and gnarled, the terminal growth was stunted, and there were no lemons adorning the scraggly, scale-infested branches. Destructive aphis covered the leaf growth. It was the very picture of a sick, malnourished tree.

Inasmuch as I had a dwarf Meyer lemon tree in my own Gardena garden, which had borne a fine crop of over 100 lemons the year after planting, with new terminal growth the second year after planting that measured twenty-seven feet around the drip of the branches, and with the added blessing of no aphis, no leaf-curl, and no red-scale; I was particularly interested in this 5-year-old tree that was apparently doing nothing.

Mrs. Griggs, who had an otherwise beautiful garden, was definitely worried about her pet lemon tree. "Every year I give it a liberal dressing of Bandini Steer Manure," she assured me. Like Gracie, in Baldwin Park, with her extensive use of barnyard manure, my good Los Angeles friend thought she was a loyal Organiculturist, and that she was doing exactly the right thing in applying raw, or only partially decomposed animal wastes to the root areas of her young tree.

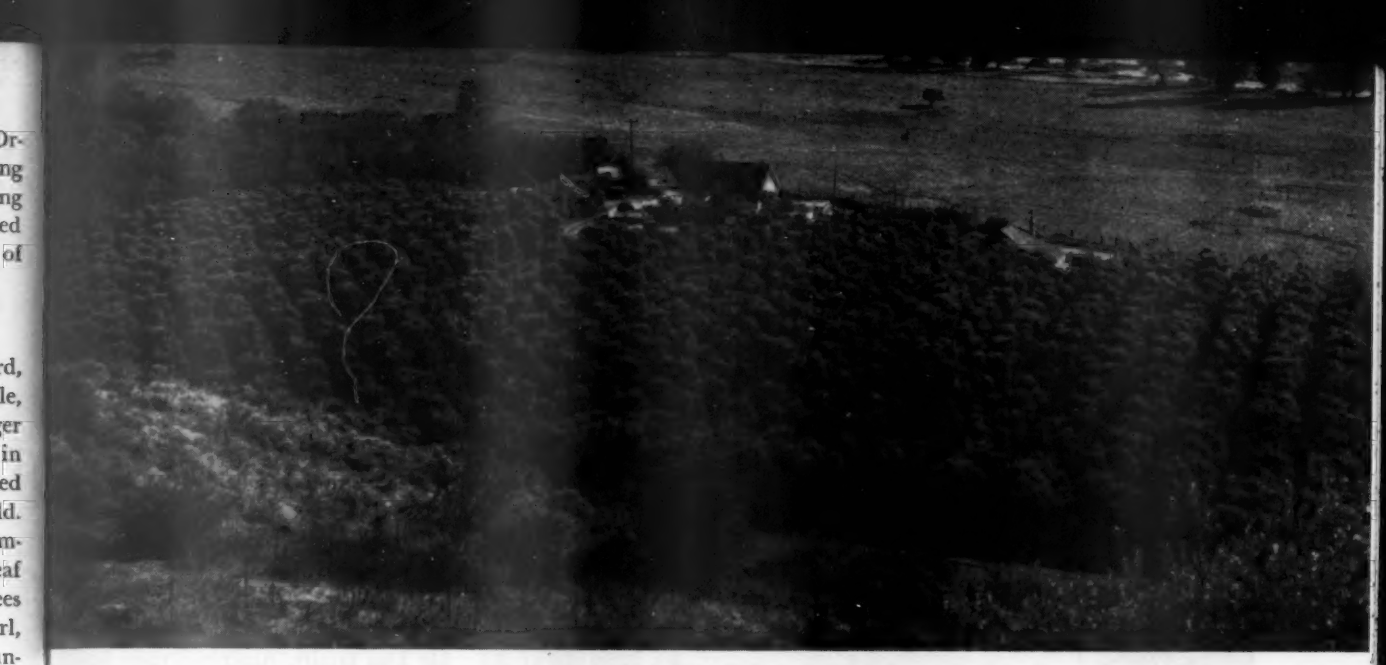
Sir Albert Warns Us

For years both Sir Albert Howard, and his protege, Editor J. I. Rodale, have been warning us of the danger in applying any fertilizer except in the form of completely decomposed compost, to fruit trees—young or old. In our Gardena garden finished compost-humus, plus a 3-inch Elm leaf mulch had protected our young trees from destructive red-scale, leaf-curl, and aphis. On the other hand, uncomposted steer manure had left Mrs. Griggs' little tree wide open to attack from all three. One type of organic fertilizer had built "immunity"—the other had failed to do so! May I say here, there is nothing the matter with Bandini or any other brand of steer manure. It's all great stuff—IN THE COMPOST HEAP!

I was talking the other day with the Farm Manager of beautiful San Pasqual Academy. Among other informative items, this seasoned veteran of farm and garden remarked that he had "burned up more good soil" with barnyard manure than he ever had with commercial fertilizers! Other agricultural experts have told me the same story. If I had been a little braver, I might have suggested that if he had composted those same manures, there would have been no "burned-up" soil or crops.

Raw Manure or Compost?— For the Pasture

My friend, Franz Dietrich, former Farm Manager of Auburn Academy in Washington, gave us an interesting and enlightening experience last Winter in Seattle. He told of his recent visit to a large dairy farm in the environs of Portland, Oregon, where he was formerly employed. In "making the rounds" with the chief herdsman, he noticed large, snow-covered heaps dotting the landscape.



A PLEASING PANORAMA

It would be hard to find a more beautiful fruit farm than this one, owned by David Phillips. For ten years Phillips has been building up the humus and the LIFE in the soil, and Mother Nature has rewarded his efforts magnificently. According to the record, 1,200,000 pounds of Bartlett pears have been harvested from these three acres.

Kicking the snow from a portion of one of these heaps, he found that they were literally piles of dead calves! As an experienced Dairyman, Franz knew that this farm was having trouble. As an Organic Gardener, he was interested in what disposition was being made of the barnyard manure from their extensive herds. In response to his question, Franz was informed in no uncertain language that "not an ounce of manure was sold, or taken from the farm." All animal wastes were carefully conserved and spread out on the permanent pastures. Yet, in spite of all this conservation of raw manures, the herds were suffering from disease. In other words, they were having plenty of trouble!

A few weeks later, it was my privilege to visit Charles and Laura Scudder's model dairy farm near Whittier, in Southern California. It was the loveliest sight I had seen in years —and the record would make your eyes bug out. Disease conquered! No Bangs—no "Q" Fever—no "T. B." for more than five years! At the Fair the Scudder Farms were capturing most of the "Blue-Ribbons" with their prize-winning herd. On every hand there were signs of perfect health and vitality—in other words, "Contented Cows."

Alfrieda Rooke, Executive Secretary of the American Academy of Applied Nutrition, who accompanied us that day, had told me a little of the story back of all this overwhelming success. "At the root of this breath-taking record, are the COMPOST HEAPS!" says Alfrieda. And to bolster up her story, she persuaded Charles Scudder to lead us out to the grove where Laura with the help of school-boys had built heap after heap of compost. What a sight for sore eyes! It actually made me drool.

"Whenever we need a special dressing for one of our permanent pastures," observed Charles, "we give it some of Laura's compost." And as a result, near miracles happen on that farm—miracles of health, miracles of vitality, miracles of resistance to all manner of diseases that afflict other Southern California herds.

Yes, indeed, my sister Gracie, can and does grow a beautiful garden. But will those flowers and vegetables and fruit trees build up a resistance against disease and pests? Professor Merriam, former owner of my ten Paradise acres, used only animal manures for fertilizer under the apple and walnut trees. No commercial fertilizer, according to the record, was ever used. Yet for two consecutive seasons, without a spray program, the apple crop was written off at a 99% loss from the depredations of the maleficent codling moth! If raw, or even "old" manure is as good as compost, why doesn't it perform?

Sir Albert and the Nematodes

When my friend, Ray Nelson, of San Pasqual strawberry fame, became interested in converting his forty acres into an Organic Farm, we air-mailed a Special Delivery Letter to Sir Albert Howard in London. What Ray wanted to know was this: "Will the use of compost-humus protect my strawberry land and plants from the nematodes?" Ray was having trouble with these little fellows, and the University Professors had told him to "fumigate" his soil with "DDT." Two weeks later, back came a gracious air-mail letter from Sir Albert. Among other interesting and helpful items from our revered leader, was this word of courage and assurance:

"You may tell your friend, Mr. Nelson, that if he will use an adequate amount of compost humus, made with the proper ratio of vegetable and animal wastes, he will overcome the nematode problem on his berry farm."

AUGUSTINE ASCENDING ELM

Framed by the usual spreading type of American Elm this youthful lofty new strain is seen in sharp contrast. Photo was taken during mid fall permitting both outline of growth and branching habit to be shown.

GOOD NEWS

A new elm for landscaping

By PAUL PFUND

FOR everyone, and especially those who have suffered loss of Elms because of the destructive virus known as *phloem necrosis,* it will be heartening to learn of a new and vigorous type of fast growing Elm recently discovered. It has been undergoing most severe tests for some time at one of the largest universities and thus far gives every evidence of being immune to plagues. Its characteristics are sharply contrasted with those of the usual spreading type in that it is of a relatively narrow top growth, the parent tree being about 90 feet tall and only about 30 feet in width most uniformly over its entire height. It produces no seeds and therefore must be propagated by scions (grafts). This ensures uniformity of type.

These characteristics make it especially suitable for street planting or in any area where space is relatively limited. The root growth is of such nature that it is no threat to walks or curbs.

This youthful addition to the noble Elm family, America's most historical tree, is a boon at this time when so much apprehension is felt concerning the future of Elms. It is very probably a natural mutation proving again that through natural processes our matchless Creator has made provision for all needs as they arise.

So profoundly important did the discoverer, Archie Augustine, lifelong nurseryman (now deceased), believe this variety to be, that he implored a few of his friends to make a most careful study of its value and urged its propagation. As a result there came into being the Augustine Ascending Elm Research Ass'n, Inc. The tree has been named Augustine Ascending Elm.

Propagation is being carried on. Such trees as have become available have been eagerly contracted for by a number of large and smaller municipalities. There is already a waiting list of increasing numbers of municipalities and Park Districts.

There will probably be enough trees available for some distribution to the general public by fall of this year and spring and fall of 1951. It is aimed to make wide distribution as quickly as possible. Officials of cities, towns, villages and Park Districts may communicate with Augustine Ascending Elm Research Ass'n, Inc., 932 East 50th Street, Chicago 15, Illinois.

GET MORE OUT OF YOUR GARDEN

Succession and companion planting of vegetables.

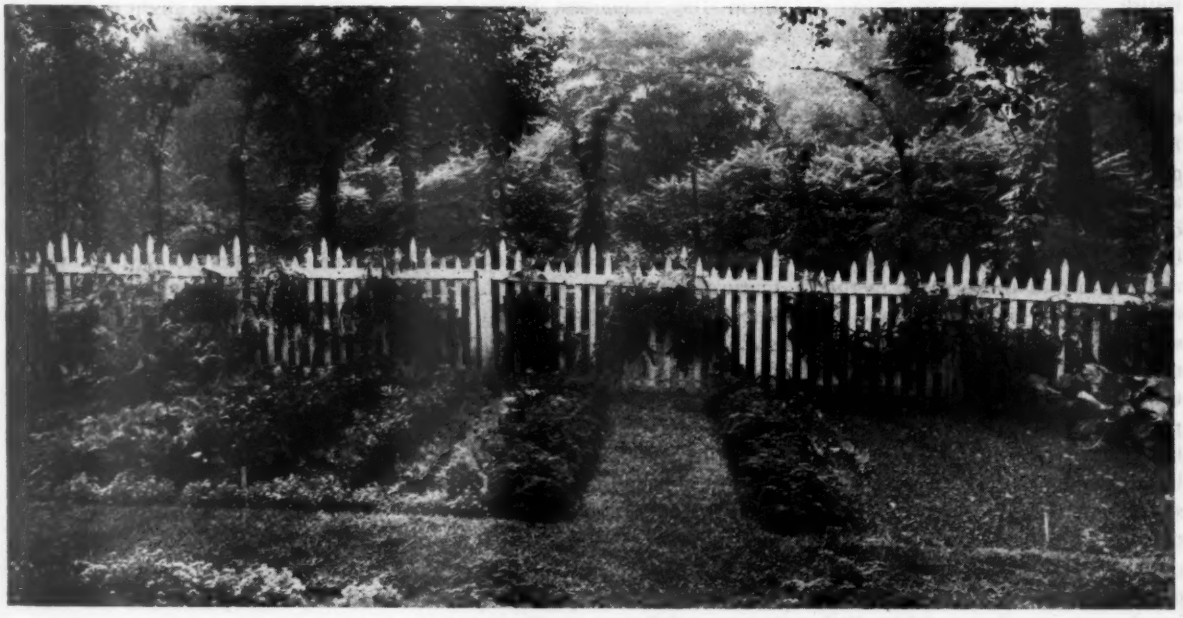
By WILLIAM ACKERMAN

HOW ECONOMICALLY you and your family will eat this fall and winter depends largely upon what you do in the garden this month. For the gardener with limited space, careful planning of succession crops will assure a large supply of fall vegetables for the table, for canning, and for storage. With the onset of hot weather, the spring urge to delve in the soil is gone and it is an effort to leave the shady porch and head for the tool house. With a little planning, however, advantage can be taken of the cool mornings and long evenings.

Succession Cropping Defined

Succession cropping is a kind of short rotation in which certain considerations are necessary for any degree of success. First of all, each crop in the succession must be able to mature in time to allow for the utilization of the space by a second crop, which in turn will mature before frost. The cultivation needed for the successful establishment of the first crop in the series should be such that the land will be in proper condition for the succeeding crop. The second crop should be sufficiently unlike the first crop that it does not require the same nutrient elements from the soil that were used by the initial crop. This decreases the possibility of poor growth of the second crop due to the depletion in the soil of particular nutrient materials by the first crop. Succession crops which are of different botanical families will also prevent the carry-over of diseases and insects from one crop to another. It is well to follow root crops with leafy vegetables, or vice versa.

It is possible to make careful advance plans for succession plantings but these seldom work out just the way you originally calculated. This is especially true where such plantings are to follow earlier crops after they have finished their usefulness and are removed. Often some plants will come into bearing later than expected, and the gardener hates to remove a plant that is still furnishing him with food. For this reason probably the most practical plan is



Mixed Vegetable Garden. Tomatoes on the Fence. Mixed Plantings in the Rows.

to have a list of the vegetables which you expect to use for succession plantings and have the seed on hand, then watch for opportunities to work them in. If, for example, celery is to follow early cabbage, the second crop can be set out between rows of the first, removing the remains of the cabbage as each head is cut.

Examples of Succession Crops

The following are some examples of succession crops that work well together:

Peas, followed by cabbage, beans, tomatoes, or celery.

Spring spinach or lettuce by beans and tomatoes.

Early carrots by autumn spinach, kale, turnip, winter radish.

Early potatoes, followed by fall cauliflower, or turnips.

Onions, beans, early beets, summer squash by kale, turnip, kohlrabi, winter radish.

Early sweet corn by a second crop of the same or autumn spinach, beans, tomatoes, celery.

Kale followed by potatoes or some other main-season crop.

Radish and bunch onions by early cabbage or celery.

Early cabbage followed by late beans (for canning) or by horse radish.

Fall-sown spinach by strawberries.

Dandelions by potatoes.

A difficulty frequently experienced in starting seeds after the first of June is to get prompt, strong germination. If the soil contains adequate amounts of compost and organic matter, the soil will not dry out, but if the gardener has only recently begun the organic method and the soil is light in texture, the seed may lie in the soil for a long time before sprouting. This situation may be remedied by the proper preparation of the seed and the seed bed before planting. First it may be desirable with many seeds to soak them well in water for a day or so before they are planted. The outer seed coverings may then be dried somewhat to facilitate planting by mixing them with a little dry soil. Open up light furrows, two or three inches deep, with a hoe or other garden tool where the seed is to be planted, and fill them with water. Let it soak and then repeat the watering several times if necessary until the water is no longer readily absorbed. The "porous hose," which attaches to the end of your garden hose and slowly oozes water through its side walls for its entire length, is ideal for this purpose. Fill each thoroughly moistened row with an inch or more of moist compost. Then plant the seeds, covering to the required depth.

Types of Succession Crops

There are two types of succession crops to be planted during June: follow-up crops designed to maintain a continuous supply of those foods that are used right along 'til the end of the season, and late crops for fall use and winter storage.

The first group should be planted at regular intervals of two to four weeks according to the space available and the garden plan. The recommended varieties of this group, the time required to grow to maturity, and the approximate sowing dates for the last planting are given in Table I. Of the vegetables listed in the table, six of them (i.e., tomatoes, beans, beets, carrots, corn and cucumbers) are of value for canning, pickling, or storing and therefore should be considered in any plans for the winter food supply.

The fall and winter crops are generally cool-weather-loving species and can be grown successfully only by so timing them that they will mature just before danger of frosts severe enough either to kill them or check further development. Similar information as that given for follow-up crops in the previous table is included for fall and winter crops in Table II.

The cabbage group is sown from June 1 to 15, to provide stocky seedling plants for setting about mid-July. By far the best results will be obtained by starting these in a specially prepared seed bed. Success with the cabbage group will depend largely upon getting a quick, strong start when the plants are first set out. Good results may often be obtained by merely planting in good soil with no additional preparation, but a little extra trouble may prove well worth while This consists of using some compost together with a combination of tankage, cottonseed, or some other high-nitrogen organic fertilizer and phosphate rock or bone meal, and mixing this thoroughly with the soil where the seedlings are to be planted.

Essentials for Strong Plants

Four things are essential to produce strong, stocky plants: keep the soil moist until the seed has germinated; thin the seedlings out to three or four inches apart as soon as true leaves develop; keep the soil loose and friable around the young plants; and lastly, protect them from flea beetles and aphids. A simple way to protect the young plants in the row from flea beetles is to place boards six to eight inches wide, on edge, along both sides of the row, holding them in place with short stakes and covering them with a double thickness of mosquito netting. Most gardeners do not bother to do this, but the slight extra effort involved is a low price for the assurance of better plants.

The rainfall during July is not generally as plentiful as the gardener might often wish, so the practice of conservation is essential. Weeds are great wasters of water. They continually pump precious water from the soil which would otherwise be utilized by the garden plants. An efficient and easy way to reduce the weed problem is through mulching. A heavy mulch will not only keep out the weeds but it will hold the moisture in the soil where it is needed.

If the mulch has been applied while growing the first crop it will be an easy matter to push it aside a little in those places where the second crop plants or seeds are

(*Continued on page 56*)

Globe-flower or *Trollius*—a hardy shade-tolerant plant belonging to the Buttercup family.

GLOBE-FLOWER

Plants for the rock garden (A series)

By G. L. WITTROCK

Assistant Curator of Education, New York Botanical Garden

VISITORS, walking through our Rock Garden and observing the Globe-Flowers, often exclaim with the wrong identification: "Look at those beautiful large, double, yellow buttercups." The colony of flowering plants noted is about 20 feet from the path and along the bank of a small stream; from the distance they do look like Buttercups, in fact, they belong to the Buttercup family, *Ranunculaceae*. On close comparison, however, the Buttercups and Globe-Flowers are different. True Buttercups have 5 or more yellow petals and sepals of equal length; the Globe-Flowers have 5 to 15 petal-like colored sepals that tend to curve inward, giving a globe effect, while the true petals are distinctly much shorter and smaller within the flower.

The Globe-Flowers are known under the botanical name *Trollius*, a genus of 12 species of the North Temperate Zone to the Arctics. *Trollius europaeus* is the Globe-Flower in England. The genus name *Trollius* is of Germanic origin from the word "Trol," meaning round, and alluding to the globe shape of the European species. It is also known as "Trollblume," "Globe Trollius," "Boule d'Or," "Globe Ranunculus" and "Globe Crowfoot." One authority states that "Trollblume" seems to signify in old Germany a magical flower. In Scotland, the flower is called "Luchen-gowana" and "Cabbage Ladies." Linnaeus mentions that Globe-Flowers were used in Sweden by strewing the flowers on floors on holidays. At least, in olden days, they were a favorite flower for festivals, and they were collected in early June by young men and girls to decorate cottage doors.

The Swedish botanist, Peter Kalm, who explored our eastern States, affirms that Globe-Flowers have medicinal properties, but that they lose the greater part of their active principle in drying, and the properties are definitely destroyed by the action of heat. However, they are used in Russia as a remedy for certain obscure maladies. Another authority states that they have been used for scorbutic cases. No medicinal properties are recorded for the Globe-Flower in our modern medicinal literature.

Globe-Flowers require a moist soil and thrive best when planted in swampy parts of a rock garden, in shady wet beds or on margins of ponds and streams. The species make most attractive spring-flowering clumps of yellow and orange. The plants are propagated either by seed or by division of the roots. Clumps should be lifted, divided and replanted every 3 to 4 years. This can be done from October to April. During dry weather the plants should be watered freely. Seeds should be sown outdoors in a loamy soil in a shady location in September or April.

The plants are low perennial herbs, erect or ascending from thickened, spreading fibrous rootstocks. The leaves are dark to bronzy green, basal and on the stem, and palmately lobed or cut, like those of the Buttercups. The flowers are most showy, whitish, yellow, orange or even purplish, and are usually borne solitary at the ends of the stems and branches. The fruit is a 1-seeded follicle, a number being clustered in a colony.

The species most planted in Rock Gardens is *Trollius europaeus*, which has incurved sepals so that the flowers have a ball-like appearance. A large number of hybrids between this species and *Trollius asiaticus* are also to be had. The plant in the illustration is a hybrid known as *Trollius hybridus var. goldenella*. This variety has been growing in our Rock Garden for many years and its decorative flowers have been the source of much admiration by visitors during the late spring months when they are in bloom.

A SEMINAR ON POTASSIUM

How to get safe sources of potassium for the soil.

By WILLIAM ACKERMAN

POTASSIUM IS one of the three most popular elements that the organic farmer and gardener should rarely worry about. Plant matter is full of it and compost made with an abundance of green stuffs contains a sufficiency of it. To add potassium in chemical form is playing with fire. Two French scientists—Pierron and Schrumpf—in their studies, showed that those regions that were too rich in potash had more cancer cases in humans that ate the food raised in such soil. The plant is a drunkard when it comes to potash; it can't resist taking in extremely large quantities of this element, far in excess of its needs. It indeed seems strange that plants should take in so much potassium when, so far as is known, they do not build it into the structure of any of their parts. Not much is known about the function of potassium in plants. More is known about what happens to a plant when this element is deficient. From such information, theories are advanced that potassium enhances the plant's ability to resist disease, cold, and other adverse conditions, and that it functions in the processes whereby sugars are made from carbon dioxide and water. Potash tends to counteract the ill effects of too much nitrogen, while in delaying maturity it works against undue ripening influences of phosphoric acid. In a general way, it exerts a balancing effect on both nitrogen and phosphorus, and consequently is especially important in the soil.

Q. Is potash stable in the soil or is it lost by leaching? If it is lost, is there any way I can hold it in the soil?

A. Experiments were performed at Cornell University to determine the loss of various nutrient elements in the soil. It was found that the losses of nitrogen, potassium, and calcium by leaching are large wherever percolation is appreciable.

The availability and solubility of potassium in manure is about equal to that in chemical fertilizers. The simplest way to hold the excess potash in your soil would be to increase the humus content. The humus will see to it that the plant gets only the amount which it should have, keeping the excess potash in reserve.

Natural Mineral Sources of Potash

Q. May potash be applied to the soil in the form of ground rock products?

A. Yes, the following are excellent natural mineral sources of potash:

MARL—Green sands owe their green color to the presence of glauconite. Commercial beds of green sand contain approximately:

7 per cent potash
50 per cent silica
18 - 23 per cent Oxides of iron
7.5 - 10 per cent alumina
3 - 7.5 per cent magnesia

GRANITE—Granite rocks contain feldspar. Feldspar is high in potash which becomes available to plants if it is finely ground. The old theory was that potash had to be in the form of a soluble salt to become available to plants. Since the advent of new machinery which grinds exceedingly fine, we feel the insoluble potash salt is superior to the soluble potash fertilizers. The root and soil acids make the potash soluble in the soil in sufficient amounts to supply plants.

BASALT—Basalt is a rock. Pulverized basalt may also be used. It's potash content is about 1.5 per cent.

Q. What are the general potash deficiency symptoms in plants?

A. The leaves of crops suffering from a potassium deficiency appear dry and scorched at the edges, while the surfaces are irregularly chlorotic. (absence of chlorophyll).

Mulching and Potash Supply

At Purdue University, Clarence E. Baker found that mulching with manure, straw, and soybean hay, eliminated symptoms of potassium deficiency in a peach orchard. Check trees, which received no mulch did not recover. Similar results have been observed at other

State Experiment Stations with peaches, apples, and other fruits. It appears that for some reason, when heavy mulching procedures are followed for several years, the addition of potassium fertilizers become unnecessary.

Q. Would you advise me what fertilizing material can be used to add potassium to the soil in organic gardening?

A. By placing 6 inches of green matter to every 2 inches of stable manure in your compost heap, you supply adequate amounts of potassium for gardening purposes. Once the moisture of green plants is eliminated and the material is broken down, a great percentage of the solids consists of potassium.

The Relationship of Lime and Potassium

Q. How is the availability of potash affected by the use of lime?

A. The solubility of potassium, manganese, iron and boron is often decreased by the addition of large amounts of lime material to the soil to decrease acidity. It has also been noted that deficiencies of potassium are most likely to occur during relatively dry growing seasons, whereas deficiencies of magnesium and manganese are more frequent during relatively wet growing seasons.

The Relationship of Potassium and Manganese

Studies were made by T. R. Swanback on the effect of manganese on the absorption of potassium and calcium. The symptoms of manganese deficiency were most pronounced with low potassium supply, less with medium potassium supply, and not noticeable in the plants supplied with the highest concentration of potassium.

Potassium and Legume Crops

Albrecht, Klemme, and Mierke, writing in the Journal of the American Society of Agronomy, found that potassium helps put more nitrogen into sweet clover. These authors report that "While sweet clover is commonly considered the crop that can be established on most any soil by liming alone, after other and more desirable forage legumes have failed, one dare not forget that nitrogen delivery by this crop as well as its greater production of bulk calls for other fertility elements besides calcium and phosphate.

After our soils are once heavily limed, sweet clover as a collector of nitrogen, may need extra fertility elements in the soil, with potassium well near the top of the list."

Q. In citrus orchards, does potash increase the size of the fruit?

A. According to E. R. Parker and W. W. Jones, fertilizers which supply potassium to the soil increased the size of orange fruits during a long-term experiment at Riverside, California. The increases in fruit size in this experiment were obtained by the application of potash and manure or other bulky organic materials. It is thought that the use of bulky organics gave greater yields because such materials create more favorable soil conditions as well as supply potassium.

Kelps for Composting

Q. Can the kelps (brown algae which live in the sea) be used in the compost heap?

A. The kelps are excellent composting materials and are a good source of potash and iodine. The potash content of kelps, according to the species, varies from 1 to 5 percent. The giant kelp, Macrocystis pyrifera, is a perennial which can be harvested several times annually. The potash content of the dry tissue is about 1.5%. Kelps also contain iodine in sufficient amounts to meet the needs of plants.

Q. We have some orange rinds every day. Are they of any value in the compost heap?

A. An ash analysis of orange rind showed a content of almost 3.0% phosphoric acid, and 27.0% potash. This is similar to the skins of other citrus fruits and to potato peelings. The latter may even be higher in phosphorus. But while potato skins are rather low in nitrogen, some citrus fruit, especially the spongy skins grown on fertile soils, have considerable amounts of nitrogen in them. We should, therefore, advocate the use of all such material in the compost heap.

Q. Recently commercial lye was recommended to me as a source of potash in making compost. Will lye take the place of wood ashes?

A. Commercial lye is far too caustic to be used in the compost heap or in the soil. Wood ashes are far better as a source of potash.

Other Potash Fertilizers

In addition to the materials previously mentioned there are many other materials which contain appreciable amounts of potassium and may be used as valuable sources of this element. Such materials are as follows:

MATERIAL	*POTASH CONTENT (K_2O)*
Woodashes (broad-leaves)	10.0%
Woodashes (coniferous)	6.0
Molasses wastes (curbay)	3.0 to 4.0
Flyash	12.0
Tobacco stems	4.5 to 7.0
Garbage (NYC analysis)	2.3 to 4.3
Water Lily stems	3.4
Cocoa Shell residues	2.6
Potato tubers	2.5
Dry potato vines	1.6
Vegetable wastes	1.4
Castor pomace	1.0 to 2.0
Rapeseed meal	1.0 to 2.0
Cottonseed meal	1.5
Olive pomace	1.3
Beet wastes	0.7 to 4.1
Silk Mill wastes	1.0
Wool wastes	1.0 to 3.5
Hay Materials	
Vetch hay	2.3
Alfalfa hay	2.1

(*Continued on page 55*)

WHY I GARDEN ORGANICALLY

Humus corrects the cement-like hardness of chemically fertilized soils.

By E. J. ANDERSON

WHEN I started raising vegetables and flowers a few years ago I found that there was pretty general agreement among the writer-gardeners that chemical fertilizers and insecticides are indispensable for the happiest results. This seemed reasonable to me. Isn't this the age of science? Hasn't the science of chemistry done amazing things for the industrial world? Why can't the right chemicals do as much for our agricultural world?

The chemical corporations, of course, did their part to educate me. Reading their pleasant persuasives in the magazines, I accepted their contention that most soils have an undersupply of needed minerals and that the smart remedy is to mineralize the land artificially. The advertiser would offer me a box or bag or can of something that chemistry assertedly had discovered for the special benefit of *my* garden, and he'd say cajolingly, "Here's the means to a more bountiful beanpatch for you, sir; here's the way to bigger and better tomatoes, tastier cabbages, nicer carrots, free from all bug mutilation." Although I knew the chemical people hoped to pocket my money, I had only to recall the presumably disinterested endorsement of the experts to fancy that my vegetable plot did require these artfully propagandized fertilizers and insecticides.

The garden magazine which arrived every month, a magazine expressly designed to help duffers like me, approved of compost but seemed to think it was a luxury a fellow could get along without. I'd do well to start a compost pile but my main reliance ought to be on chemicals. It so happened that this very magazine eventually called my attention to an investigator who was convinced of the serious shortcomings of artificial plant foods and bug repellants. Broadmindedly the editors had printed two articles debating the merits of the chemical versus the organic way of growing plants.

The friend of chemicals had written a piece which seemed to me unanswerable, but afterward I read the unsettling reply of a Mr. Leonard Wickenden. It seemed that Mr. Wickenden was a professional chemist whose avocation was gardening. He had given his superior chemicals every chance to demonstrate their efficacy but the results had been disillusioning. His plants often succumbed to diseases, insect injury, sterility. At length he chanced upon a revealing book written by a soil scientist, Sir Albert Howard's *Agricultural Testament.* His comment was interesting.

"I, being a chemist, found the book fairly incredible. But I decided to give his theories a whirl. I did everything I could to get humus into my garden. I had manured it occasionally before, but now I dug in leafmold, I built compost heaps out of everything I could lay my hands on. The following spring I dug in my compost, sowed my seeds, and awaited results—with, I may say, more scepticism than hope. For the first time I went right through the season without once spraying my tomatoes, and I had the finest plants and the biggest crop I had ever grown." ("See Here, Mr. Carleton" by Leonard Wickenden in *The Home Garden,* June, 1946.)

Upon reading his article I concluded that Mr. Wickenden had knocked a few good-sized holes in the chemical man's armor. I still had faith in chemical fertilization but it was a weakened faith. On walks in the neighborhood, on hikes along our Colorado mountainsides, I used my eyes more observantly. I noticed how much healthier were the plants in nature's fields and valleys. That beautiful leaf-green which nature achieves without any effort whatever, what is its secret? Poking

around, I observed the stone and twig and leaf mulches which protected the soil from the scorching sun rays. I scooped up a handful of the earth. I looked at it, smelled it, mentally compared its velvety blackness, its woodsy odors, its soft crumbly texture with the clayey cement I was working with back home. How did nature build up such a soil? I didn't know, but I did realize that there had been no chemical doctoring to attain that perfect loam.

I saw I needed the help not only of man but of Mother Nature. I started collecting material for my first compost pile. Surprisingly, it turned out to be a lot of fun. It was fun because it was creative work. What was I creating? The conditions for the existence of something the chemist cannot achieve in his chemicalized world—life. I had only to supply food for her microorganisms in the form of weeds, kitchen waste, henhouse and rabbit hutch litter, and wet the stuff down well, and Mother Nature would do the rest. Thanks to her microbiology and the resultant hums, a bricklike soil would become spongy, wilted plants would have moisture, anemic vegetables would be revitalized.

I carried on with my gardening activities for a couple of years, sometimes successfully, sometimes unsuccessfully. I could seldom be sure of the causes for the pitiful or plentiful results as too many factors were at work, some of them known, such as the weather, others invisible, such as soil organisms promoting plant disease or health. But I grew convinced of two things. Artificially fertilized plants were not performing as spectacularly as the experts and the advertisers had predicted they would. Vegetables experimentally grown with compost were as a rule bigger and more flavorsome, contradicting the claim that inorganically-fed plants would yield the finest harvest.

By now sceptical of the infallibility of the chemically-minded know-it-alls, I had a growing curiosity to hear what the organic school had to say for itself and subscribed to *Organic Gardening*. This magazine quickly won my confidence. Those of its editorials and articles which were explanatory of nature's methods showed much greater biological awareness than anything I had read in the chemical-exploiting press. Every month I read my copy with care and had the feeling, "At last I am on the right track."

It did not take me long to recognize the advantages of compost over chemicals in giving a soil better fertility, aeration, water retentiveness, and a richer biological life. But bugs were my big problem and it seemed to me that sprays and dusts were a weapon I'd be a fool to throw away.

Then an editorial by Editor Rodale, "Insects: The Censors of Nature" gave me a new conception; the six-legged critters are not really enemies of the garden, I learned; in the long run they are its friends. Mother Nature is too good a plant breeder to reproduce sickly plants; insects are her instrumentality for preventing the survival of the unfit. When insects appear in large numbers in my garden and start wrecking it they are telling me that Mother Nature disapproves of my husbandry.

No wonder the wearisome and expensive chemical warfare had gotten us no true relief from the insect hosts. Everybody would advise my wife to use nicotine on her aphid-infested roses. Using it, she would kill thousands of the plant lice. But in a week or so still more rose buds would refuse to open or would have disfigured, discolored petals. Yet our recently planted roses, *Peace, The Doctor, Crimson Glory,* would be almost free from aphids. Why? Presumably because these roses were superior specimens, full of vitality, that we had planted in large holes copiously supplied with loam and organic materials. The older roses had been planted by former owners of our place. Last summer I dug up one of them and saw why it had died. It had been put into a shallow pocket of earth; when its roots grew down into the yellow clay and rocks that had been excavated from the nearby cellar the poor thing had starved to death. The other aphid-eaten roses no doubt were also putting up with a starvation diet.

Then there were the instructive battles with flea beetles. These I had sometimes licked with a dust gun. But was that the whole explanation of their disappearance?

Organic materials usually are easily collected.

I noticed that flea beetles bothered my tomato transplants only when they were in a state of shock; as soon as they had time to stretch out their cramped roots and adjust themselves to their new environment they grew sturdily and the flea beetles left them alone, evidently finding them unsavory.

While I learned a lot about the deleterious effects of chemicals from *Organic Gardening*, I wasn't fully prepared to give up the use of insecticides. I believed I should try to get along without these dangerous chemicals but until my soil was rebuilt organically, which probably would take four or five years, I might properly employ poisons in emergencies to check bug saboteurs that otherwise would ruin a whole planting of beans or tomatoes.

But I pumped my dust gun and sprayer not only sparingly but rather guiltily. I was persuaded that nature had far better ways for controlling insects than those offered by chemical science.

My struggle with the grasshopper proved how right this belief was. Out in this part of the country the grasshopper is garden enemy number one. Two summers ago western locusts threatened to eat up our whole garden. After all my hard work I was sick. I got poisoned bran from our County Agent, which helped save the crops although I must say the hoppers were still destructive until Mother Nature came to my rescue with the right weather: rains and, in a couple of weeks, light frosts.

Last summer my strategy called for using more compost in the garden and little if any poison. As the season moved along we began to see nymph grasshoppers jumping up when we walked over our lawn. It worried me. There were so many of them. The newspapers carried warnings from the City Forester of Denver and from Colorado Agricultural College; in all probability this would be our worst grasshopper year and we had better give our plants ample chemical protection in time.

All too soon the grasshoppers were full-grown. They had excellent appetites. A climber rose that was commencing to bloom for the first time was set back a year; other flowers were ravaged. In the emergency drastic measures seemed called for. I borrowed my neighbor's air pressure sprayer and mixed several tankfuls of chlordane. It killed a lot of grasshoppers, all right. But that isn't all it killed. We found crickets and bees on their backs, kicking their legs in the death throes. In a few days the residual chlordane started yellowing the leaves of our flowers. For a while we thought our roses and snapdragons were done for. They finally recovered—after several months of leaf ugliness and defoliation.

Vowing that I would never again drench my beloved plants with caustic poisons such as chlordane, I scratched my head and wondered what I should do to check the grasshopper hordes that were moving in on me from the nearby prairie and weedy vacant lots. Well, I was an organic gardener now; I had better stick to natural methods of control.

We opened up our non-chemical warfare with a couple of homemade nets such as butterflies are caught in. When the grasshoppers had quieted down around sundown my son and I scooped up hundreds of them off grapevines and tall-stalked plants, especially sunflowers. But it seemed that for every hopper we got rid of in this fashion ten others invaded our place from the roadside ditches or a neighbor's jungle of weeds. I consulted my *Organic Gardening* magazines but this particular problem was not discussed in the few issues I possessed. I asked myself, "How would nature meet this challenge?"

Chancing to see robins flying low and catching grasshoppers on the wing, it occurred to me that here was my answer. Having about thirty young chickens cooped up, we turned them loose. They damaged our vegetable garden and flowers to some extent, though usually fencing and vigilance on our part prevented noticeable depredations. Certainly the chickens were far less destructive than the ravenous insects would have been.

Our young cockerels and pullets were wonderful grasshopper eliminators. They either attacked regimentally, deploying over a wide front; or they rested in the shade and deputed two or three of their number to patrol the grounds until recall time, when the entire flock would go out for another massacre of the foe. Alternately all day long, there were these big grasshopper hunts followed by small patrol par-

Insects are Nature's censors. Poisons which kill insects, injure plants.

ties making a careful circuit of the premises. It was especially amusing to watch the feathered patrolmen; they took their responsibilities so seriously; they pounced upon grasshopper foragers so comically. Once a raider had been spotted it was a sure kill; he might be swallowed after his first or his second jump but he was always swallowed.

When I reflect that last summer the grasshopper threatened to become as big and hungry as geese, but that, after our poultry were enlisted to counter-attack, any grasshopper injury was undiscoverable, I am full of admiration for nature's control methods, which are vastly surer and safer than man's.

Engaged in congratulatory handshakings with myself over the fact that what was supposed to have been our worst gardening year for grasshopper injury turned out to be our best year, I was by now pretty thoroughly convinced of the merits of organic gardening. I had learned a lesson which the you-can't-garden-without-chemicals school has yet to learn. What I had found out was this: If we don't tie nature's hands with our artificialized procedures, she is capable of dealing very smashing blows to insect invaders of our farms and gardens.

About this time I took a very enlightening walk one Sunday afternoon. Climbing a hillside, I sat down to rest and observed grasshoppers everywhere. I asked myself, "What do all these hoppers live on?" I was unable to detect any appreciable damage done to the weeds and grasses and wildflowers that covered the rolling prairie. Far fewer hoppers would have ruined my garden in no time. Why did these heavy eaters manifest a loss of appetite in their natural habitat? Were our plants tenderer, juicier? That couldn't have been the fundamental explanation because grasshoppers have such catholic tastes that they have been known to gnaw the curtains off a settler's windows.

I looked around for birds but not one was to be seen. I pondered the problem. Unquestionably these prairie grasshoppers had an enormous capacity for food. Unquestionably there was much vegetation spread out before their voracious jaws, vegetation that was chewable and life-sustaining. Mentally comparing the two sets of plants, mine and Mother Nature's, I decided at last that the main difference was that the naturally-grown ones had a vitality lacking in my artificially-raised vegetables. In some mysterious, wonderful way the grasshoppers recognized this difference and, when given a choice, expressed a decided preference for food gotten out of my devitalized garden.

Wider awake after that, I found further corroborative evidence of this law of nature which holds that plants which do not come fully alive invite their own destruction. One further example must suffice. While irrigating a long row of sunflowers one day I noted some leaves that were being eaten lacy-thin by black caterpillars. Most of the sunflowers were husky giants but a few were dwarfs. The big sunflowers had a few caterpillars on them, but they seemed to be resting and hardly nibbled the leaves. The stunted sunflowers were being ravaged. Why this difference in palatability? The people whose knowledge comes out of chemical laboratories would give the wrong answer. The only answer which makes sense is that which points to a biological law requiring plants to sustain insect injury to the degree that they grow in a nutritionally deficient soil. This was the case with my chewed-up sunflowers, which did not have the correct spacing of their big brothers and evidently had germinated from seed spilled accidentally. Apparently nature was protecting the well-established plants by destroying the competitors, since they would be robbers of food and water and show little for it while unfairly weakening the ten-footers. To these dwarfs Mother Nature was saying, "If you can't grow normally you can't stay alive. Get off my earth." And in some subtle, clever, unfathomable manner she infested the inadequately nourished sunflowers with caterpillar destroyers.

Poultry are helpful in controlling insects.

FUN ON "FORTY ACRES"

A group of professional men team up to find relaxation and fun with a king-size garden project.

By BELLE CASE HARRINGTON

MOST men who work in an office crave some outdoor recreation, and many a city-bred man, as he grows older, has a definite yearning for the country. I felt that way. But added to that, my frugal New England ancestry made me feel that I wanted my recreation to count for something. I "wanted something to take home." That was the beginning of my gardening project, which has now become something that people drive off the main highway to see.

My law firm was settling an estate and I was able to pick up a forty acre tract of very productive land. The house had burned years before, leaving a large door yard, with an adjoining orchard, which would make an excellent garden spot. All the smaller farm buildings had been cleaned away, but there remained a medium-sized barn which had evidently been used for farm machinery. There was a good well, a number of trees, and a beautiful outlook. I knew an adjoining farmer who would cultivate the fields for me and would probably plant them to easily-cared-for things like alfalfa and soy beans. I figured that the income from the crops would pay for the extras that I wanted to put into the garden.

I had a neighbor, a young fellow on a slim salary, with a growing family. I asked him— this was the

All the comforts of home.

first year—if he wouldn't like to go down to my garden and help raise some stuff to take home. He welcomed the chance. That year we planted the routine things, working Saturday afternoons, holidays, and long summer evenings. The farmer plowed the land, and we did all the rest of the work ourselves.

Before fall I began to get ideas of what I'd like to do the next year. During the winter I had the floor of the barn cemented, and a chemical toilet put in. We bought an old-fashioned chunk stove which made it possible to use a work bench and tools all winter. My young partner and I spent the cold rainy days making little tables or cupboards to take home, and we also built a wardrobe where we could hang our office clothes when we put on our work togs. I suppose we talked a good deal about going down to the Forty Acres, and by the next spring two others asked if they might join our garden club.

We are in our fourth summer now, and there are seven men in our group. We have added a good many things Three swarms of bees are one of our most interesting projects. There are clover fields all around. One of our group was a natural "bee man," and the rest of us were quite willing to take home the tempting one pound cakes of honey.

We had to have some kind of a house—labor and material were sky-high—so the quickest and wisest thing seemed to be to buy a trailer. It is a beauty. Three rooms can be partitioned off with three full-sized folding beds, a sink, an electric stove and an electric refrigerator. We pursuaded the electric company to run a wire from the nearby country village, and this also enabled us to have electric lights.

One thing seemed to call for another. We needed running water in the sink, and it was not long until we decided to have a hot and cold shower cabinet in the barn. This enabled the men to "clean up" after their work in the garden, before they put on their better clothes.

Ready to go home

Naturally, the products of our garden were the main thing, and to put it mildly, they were bountiful. Our space was unlimited, and seven men working enthusiastically can accomplish a lot. During the early summer it was nothing for us to pick four or five bushels of peas on a Saturday, corn and tomatoes beyond measure. Each of us had a locker, and one of our chief satisfactions was putting things away for the winter. Another interesting thing was that anyone of us could plant any unusual thing to which we took a fancy. Rhubarb, chard, broccoli, edible soy beans, mammoth orange tomatoes, gourds, and the many colored Indian corn were among the novelties we grew. Of course there are asparagus and rhubarb in the early spring, and a big strawberry bed, with red and black raspberries to follow.

Best of all, however, was the fact that our little resort was so easy of access. It was only six miles from the city where we lived, and at least three or four nights a week some group went down there for supper. This past summer two of the young lawyers, feeling the financial pinch, took their families there for their two-weeks vacation. When someone gives a party, inviting a group of the uninitiated is most fun of all. Some of the guests are immediately sent out to pick peas, or beans, or corn. These are quickly cooked in the pressure cookers, while other people set the big picnic table under the apple trees. Ice cream or water melon is taken out of the refrigerator, to follow the steak which has been done to a turn on the portable charcoal broiler.

You are asking yourselves, "Did the crops on the forty acres pay for all this? and quite frankly I answer "No." But it has paid for itself ten times over in the good fellowship, the relaxation, and the new love for the outdoors which has come to me and to many of my friends.

Men of organiculture

FRIEND SYKES

By JORIAN E. F. JENKS

IT IS still often alleged, in Britain at any rate, that the chief advocates of organic methods are amateur gardeners, cranks and hobbyists who do not have to grow food for a living. The truth of this allegation may be judged from the lengthening list of practical farmers and market growers who have joined the Soil Association. But perhaps the most striking refutation of all is to be found in the fact that one of the pioneers of these methods is a well-known businessman who has used them to make a remarkable commercial success of an apparently hopeless farming proposition.

Friend Sykes is no crank, nor does he lay claim to any altruistic motives. Undoubtedly he has rendered Britain great service by demonstrating how her food supply can be substantially and permanently increased. But he has chose it because he has realized from the outset that soil-building can be a sound economic investment. The fundamental difference between him and the majority of those who talk glibly of "farming as a business" is that he thinks and works in terms of long-term returns from accumulating real capital while they think and work in terms of immediate money profits.

Friend Sykes comes of a long line of hard-headed Yorkshiremen who have always had to work energetically for a living from the land or from industry. He has inherited, too, that discerning and critical eye for an animal, which has made him one of the most successful breeders of blood stock in the country. Nothing gives him greater pleasure than an afternoon among his horses, interpreting the finer points of pedigree and conformation, and the part played by feeding in building up stamina.

At his father's death, he found himself saddled with heavy business responsibilities while still a young man. With his two brothers, he soon migrated from Yorkshire to Richings Park, an estate of some 2,000 acres of rich, level land in the Thames valley. There they farmed some 500 acres themselves, and later founded the model residential town of Iver. Unfortunately, a more recent development, following the break-up of the estate, has been far from model; the industrialization of the Slough area (on the edge of which Richings stands) has resulted in a prodigious waste of first-rate farming land.

Here the Sykes brothers grew some excellent crops and achieved considerable distinction in the show-yard with their pedigree Berkshire pigs and Friesian (Holstein) cattle. The latter were adjudged the best milking herd in three counties, high yields being obtained by the liberal use of oil-cakes and other processed concentrated feeds. Judge then of the shock administered to its owners by an official tuberculin test which showed 66% of the cattle to be infected. Characteristically, the Sykeses set to work to discover the cause. One of their first steps was to sell their herd and re-stock with Guernseys, and it says much for their skill and judgment as stockmen that within two years they had a bull which won a supreme championship at the Royal Agricultural Show.

To Friend Sykes, however, farming was still perforce a hobby. His first concern was industrial chemistry, and he played an important part in the First World War by organizing the production, from home timber supplies, of acetone, a key explosives chemical which had hitherto been a German monopoly.

But despite what might easily have become a chemical bias, Friend Sykes early acquired that firm belief in humus as the key to health which has ever since inspired his farming and breeding enterprises. As a youth, he relates, he was considered the weakling of the family, not in the sense of physical puniness, but in the sense of susceptibility to any prevailing infection. Determined to overcome this disability, he took counsel with the head gardener at Richings, who agreed that the garden from which came his vegetable supply should receive plenty of farmyard muck, but no chemicals in any form. Satisfied with the results of this experiment on himself, he proceeded to an even more drastic test.

The favorite mare in the Sykes' Thoroughbred stud farm at that time was Dail who was not only a winner herself but had bred six winners, including Statesman, who ran third in the English Derby to the peerless Hyperion and was sold for 15,000 guineas. While away at a stud farm for service, she became infected with contagious abortion. Cure being

in those days unknown, veterinary advice was to have her shot. Such a verdict put Friend Sykes on his mettle; he determined to try the natural method.

Dail was therefore turned out for a long rest in a paddock which had not only been kept free of horses but had never had artificial manures. In due course, her system cleared itself of the disease and she was restored to full health, being pronounced fit to breed again by the vets. Breed again she did, producing four more valuable foals and living to the ripe age of 21. No less than 16 races in England were won by her descendants in 1946 and 1947!

When the time came therefore to sell Richings, the Sykes brothers decided to move to high-lying chalk or limestone country which could produce the bone and stamina they sought in young horses, the land at Richings being unsuitable for the purpose. It was two years before they found a place which met all their requirements; but at last, in 1936, Chantry was acquired as the future Sykes headquarters.

A greater contrast to the alluvial plain and big timber of Richings could hardly be found. The Chantry homestead itself stands 800 feet up near the crest of one of those chalk-ridges or downs that form the uplands of southern Britain, exposed to all the winds that blow. From its windows one looks out for 40 miles over rolling downs and wooded valleys clean away to the Isle of Wight, whose cliffs gleam in the sunshine of a clear day. From its windows, too, could be seen during the height of the air-raid period in 1943, the glow of burning London, Southampton, Portsmouth and Bristol.

But as a farming proposition, Chantry as it was in 1936 must have seemed sheer heart-break. Yet, strangely enough, these bare, bleak uplands represent some of the oldest farmland in Britain. For it was here that the island's first known inhabitants sought to establish themselves at a time when all the lower country was swamp and forest, swarming with dangerous wild beasts and quite impossible for settlement by men whose best tools were edged with flint. Archaeological investigations at Chantry have revealed that land up here was cultivated for food 4,000 years ago! And one of Friend Sykes' favorite rejoinders to those who insist that artificial fertilizers are indispensable is that even after all these centuries analysis shows that there are still ample minerals in this soil for all staple crops. The function of the husbandman is to make them available to plants, not to run to the factory for aid every time he sows a crop.

It is interesting, too, to note that the traditional method by which this upland soil was coaxed to yield bread and meat and beer for countless generations of Englishmen was essentially organic . . . sheep being "folded" (i.e. close-penned) on the weed-fallows and (later) on the fodder-crops with which corn crops were alternated. When, however, towards the end of the 19th century, cheap imports from the New World knocked the bottom out of the market for farm produce, while rising wages made labor too expensive for close-folding, all this high land went gradually out of cultivation and lost the greater part of its population. All around Chantry at the time of the Sykes' arrival the land had been allowed to revert to fifth-rate grazing, dotted with thorn bushes and stocked with only a few cattle, while cottages and farmsteads crumbled into ruin. A considerable acreage up here was brought back into use during the last war, chiefly by continuous cropping with the aid of machinery and chemical fertilizers; but it remains to be seen how long such methods can be maintained.

When, therefore, Friend Sykes bought three adjoining farms to protect the amenities of Chantry, their tenants' first reaction was to demand what was in effect an abolition of rent, on the grounds that such land could not otherwise be farmed. Their new landlord's reaction was to give them notice and announce that he intended to work the land himself. If, he said, he was bound to lose money anyway, he would have more fun losing it as a farmer than as a landlord. Plenty were the warnings which this step evoked. "This isn't farmland at all," declared a fellow-Yorkshireman after walking over the place, "it's just space out-of-doors!" And indeed, even at a freehold price of £4 ($16) an acre, the land looked more of a liability than an asset.

For the first few years, it looked as if every gloomy forecast would be justified. Despite the seemingly healthy situation, the land proved to be disease-ridden as well as poverty-stricken. When the Sykeses sought to establish a Guernsey herd, using a Hosier portable milking-bail, the milk-checks soon fell to a point which was quite out of relationship to the cost of the additional feed made necessary by the soil's infertility. Nevertheless, they persevered, retaining their aborted cows until Nature had cured them and concentrating them on each field in turn till the heavy manuring and trampling started a process of sheet-composting.

Then the plough was set going, so that the new fertility could be incorporated with the old matted grass-roots. With the plough went the sub-soiler . . . a revolution indeed on such land, where the soil is rarely more than a few inches deep and is crowded with flints. Needless to say, breakages were frequent, which gave the experimenters an excellent opportunity to compare crops on sub-soiled land with those on areas which had perforce been missed. The difference was so startling that sub-soiling has ever since been a regular practice at Chantry, while deep-rooting plants have become a feature of every pasture-mixture used.

In the course of 12 years, during which different classes of land and different economic conditions have been encountered, reclamation methods have varied considerably. The practice most favored is to follow the initial sheet-composting with two catch-crops of rape and Italian rye-

grass, these, too, being heavily stocked. Though he is as firmly convinced as ever that artificial fertilizers do more harm than good, and though he has in fact reclaimed Chantry without them, Friend Sykes says that he would now use a heavy dressing of ground rock phosphate or basic slag at this stage, simply to get the fertility cycle re-started as quickly as possible. Basic slag, of course is not an ordinary chemical manure, manufactured to provide soluble salts, but consists of the ground impurities of iron ore precipitated by the addition of lime during smelting. It thus contains an appreciable amount of free lime and numerous trace elements as well as phosphates, and is much used for improving grassland.

The original plan was to get each field in turn down into deep-rooting ley (temporary pasture) after the second catch-crop. But during the war the whole process had to be speeded up and as much grain grown as possible. One year 350 out of the farm's 750 acres were devoted to this crop; and it is noteworthy that yields of up to 60 bushels an acre have been grown on this thin, high-lying land after re-fertilization.

This grain-growing introduced a new problem, for the fields were soon dotted with stacks of straw, representing fertility taken from the land. How was this fertility to be got back? Muck-making was the obvious answer; but buildings for cattle were few, and often at some distance from the straw. Once again ingenuity had to come to the rescue. Rough yards were made wherever shelter and water existed, and in them cattle were placed in wintertime to eat and tread down the straw.

But the resultant muck had still to be converted into compost by stacking and turning; and it still had to be loaded into carts . . . up to 1500 tons a year of it. Owing to the scarcity of housing, labor is always scarce on these uplands. After many weeks of muck-shifting with hand forks, the men at Chantry struck; they believed in muck, but they were seeing altogether too much of it. Hence the Rapier mechanical muck-shifter, designed by Friend Sykes and built by a famous firm of agricultural engineers . . . in effect a swinging crane with a grab, either self-propelled or attached to an ordinary tractor. With this and other mechanical equipment, Mr. Sykes states that he has moved, loaded, carted and spread 400 tons of muck-compost in two days at a cost of 1/8d (say, 33 cents) a ton. Today, from 60 to 100 acres are dressed with compost every year, usually the root crop or a young ley on the poorer land.

High-class livestock, however, have always been the pivot of the Chantry farming system, and systematic mixed grazing is regarded as no less essential than compost, sub-soiling and deep-rooting leys. To the Guernseys and Thoroughbreds were presently added a breeding herd of Galloway (beef) cattle and poultry. As many as 800 sheep have also been grazed at times, and it is intended to establish a breeding flock of 200 ewes. Thus on about 400 acres of ley (there being no permanent pasture left), with a small area of kale and swedes to help out the hay in winter, there are regularly maintained some 200 head of cattle (including 60 cows in milk), 20 horses, a flock of poultry and a fluctuating number of sheep. For such land, this is heavy stocking. All livestock are "attested" and have a clean bill of health.

Now that the greater part of the land has been developed into a reasonably high state of fertility, it is worked as far as possible on an eight-year rotation. The basis of this is a four-year ley, the species for which are carefully chosen so as to provide (1) high-quality mixed herbage throughout the season, (2) humus for the surface soil, and (3) a means of bringing up from the subsoil minerals that can be added to the fertility cycle. A typical mixture for this purpose is below.

This ley stays down for four years, being mown for hay in the second and third year. At all other times it is stocked heavily on the "on and off" principle, different classes of stock following each other and the land then being given a short rest before the first lot (usually the dairy herd) is put in again. At the end of this period, the deep-rooting species are well-established and the pasture has reached its peak. It is precisely at this point that the plough is put in again, so as to mobilize the accumulated fertility before deterioration sets in and to ensure that the livestock always have relatively new grazing.

Three crops are then taken, one of which may consist of roots or kale for winter feed, and the other two of grain. The land is then

Seed mixture for permanent ley.

Perennial ryegrass	4	lbs.
Italian ryegrass	1	lb.
Cocksfoot	4	lbs.
Timothy	3	lbs.
Crested dogstail	2	lbs.
Rough-stalked meadow-grass (*poa trivialis*)	1	lb.
Common milled sainfoin (a perennial legume rather similar to alfalfa)	10	lbs.
Lucerne (alfalfa)	4	lbs.
Sweet clover (*melilotus alba*)	3	lbs.
Broad-leafed red clover (Hampshire strain)	2	lbs.
Alsike clover	1	lb.
White clover (S100, and Aberystwith strair)	1	lb.
Kidney vetch (*anthyllis vulneraria*)	1	lb.
Burnet (a deep-rooting herb)	2	lbs.
Chicory (a deep-rooting herb)	2	lbs.
Total	41	lbs. an acre

ploughed in fall to get the benefit of frosts, cross-ploughed in spring, and given as many more ploughings and stirrings as time permits up to the end of June. On July 1st it is sown with 20 lbs. an acre of white mustard, which at this time of year grows rapidly and in four weeks' time is usually six inches high. On July 31st, this growth is turned under and the land at once drilled with 2 bushels per acre of Giant Essex rye, the ley mixture being sown the following day. The rye comes away strongly—in a wet season luxuriantly—and is grazed closely for short periods, usually twice in fall and twice again the following spring, before giving way to the grasses and clovers it has been sheltering.

This complex procedure, which is followed as strictly as possible, sounds like a solemn ritual, as indeed it is. But it is a ritual with a scientific basis. Friend Sykes has discovered—and his observations were checked and explained by no less an authority than Sir Albert Howard—that in fertile soil there are two nitrogen-cycles each season. As the soil warms up in spring, its population of bacteria, fungi and earthworms increases very rapidly, and with it the accumulation of nitrates. By the end of May, this population reaches its peak. Thereafter it begins to decline unless provided with a fresh supply of food. The mustard therefore is sown to catch the soluble nitrates and supply the soil population, when the growth is turned under a month later, with easily-digested organic matter. The result is a second peak at the end of July in readiness for the newly-sown rye and ley seeds. The latter thus get a flying start, producing from the outset an abundance of feed which in turn is converted by the grazing stock into manure deposited without waste where it is wanted. This gain in both feed and fertility more than makes up for the time which (on paper) is saved by the conventional method of sowing out a ley in a crop of grain. This latter practice all too often results in a weak stand, perhaps a complete failure, of seeds that have cost (as at Chantry) as much as £5 ($20) an acre.

The Sykes policy of *stamina first* is now yielding positive results. Grain grown at Chantry, though not so luxuriant in growth as neighboring crops top-dressed with artificial nitrogen, matures and fills out naturally; despite heavy yields (up to 80 bushels an acre of oats have been grown), it rarely suffers storm-damage—no bad test on these exposed hillsides. The cattle are equally hardy, breeding regularly and growing thick coats in winter. An average annual milk-yield of 600 gallons a cow is distinctly good for such land, though less than what is hoped for when more buildings can be erected.

An excellent example of what is being achieved is afforded by a 100-acre crop of pedigree (Aberystwith) perennial ryegrass seed which was grown last year (1947) for a well-known seed firm. This strain had previously been grown in Northern Ireland, where germinating capacity had gone down to 55%—probably because growers there had tried to boost yields by heavy dressings of sulphate of ammonia. At Chantry, the crop was grazed in its first year and no artificials were used; it then yielded up to 10 hundredweights of seed per acre as against 3 hundredweights in Northern Ireland, with a germinating-capacity of 98%!

This crop, like all others at Chantry, was cured on tripods. After experimenting for years with different systems, Friend Sykes now declares himself convinced that tripods are the most economical as well as the most natural method; he uses 2000 of them. The quality of his hay is outstanding, with every leaf, flower and seed retained as well as the natural green color. A sample analyzed at Bristol University returned 11% protein and was commended as "the best ever." With fodder such as this, the need for supplementary "concentrates" largely disappears.

One more example must be quoted, since it demonstrates most vividly how humus-farming has enabled the Sykeses to achieve the object which originally brought them to Chantry, namely the raising of bloodstock with superlative bone and stamina. The small stud of brood mares has always been very carefully selected from the best families; but hitherto the exclusiveness of the English racing world has denied it access to sires that have won classic races. Despite this handicap, there has been a remarkable rise in the market value of its produce when sold at the famous Newmarket sales in competition with the best specimens of the breed. In 1945, three yearlings realized an average of less than 300 guineas each; in 1947, three yearlings averaged 2000 guineas each and were bought by well-known owners. This price may not be unconnected with the fact that every Chantry-bred horse sold for racing has won at least one race. A further result is that the Sykeses can now send their mares to top-flight sires.

Friend Sykes' reasoning, which is hard to rebut, is that if horses got by second-rank sires win from those more fashionably bred, the only possible explanation is to be found in superior stamina, which in turn can be derived only from superior nutrition. He now awaits with interest the results of combining this superior stamina with the best blood available. In the meantime, his Chantry-grown hay and oats are in high repute among trainers.

In terms of food—that crucial factor in the British economy today—production from the Chantry farms has already been increased many times over.

In recounting the story of this achievement, Friend Sykes is emphatic on two points:

(1) that it entailed a great deal of hard preliminary work in building up soil capital, and

(2) that the limit of fertility, and hence of production, is nowhere yet in sight.

Actually the turning-point came in 1943. By that date, crops, grass

(Continued on page 54)

DAYLILIES IN THE GA

Color in the garden during the droughty summer mo

By WILLIAM H. EYSTER, Ph. D.

DAYLILY is the term applied to lily-like plants whose flowers remain open but a day. The term, however, is applied most commonly to plants belonging to the genus *Hemerocallis,* which comprises about a half-dozen wild species of lily-like herbs occurring from Central Europe, through Asia to Japan; and some recently developed hybrids. The roots are somewhat fleshy and often occur in clusters or fascicles. Nearly all the leaves are basal, narrow, sword-shaped, and keeled, so that the leafless flower stems extend some distance above the leaves. It is interesting to recall at this point that the word *Hemerocallis* is a Greek word which means "beautiful for a day."

Daylilies are the most valuable herbaceous perennials. They will adapt themselves to a greater variety of soil and climatic conditions than almost any other perennial. They are hardy, easy to grow, and free from disease. Their leaves are attractive, and they give us a long period of bloom by the daily succession of the flowers. By selecting suitable varieties, daylilies may be kept in bloom from spring to late summer. Daylilies have been made even more valuable and decorative by the many new hybrids that have been developed, particularly by Dr. A. B. Stout of the New York Botanical Garden.

Few perennials can equal daylilies for giving brilliant and abundant colors to the garden in the midsummer months of July and August. It is at this season that many gardens are sadly lacking in colors. Daylilies get along with almost no care regardless of wind or weather, but repay the gardener manyfold for any garden courtesies extended to them. They will succeed where many other flowers fail, and will give you a great profusion of flowers as large and as beautiful as the finest true lilies. It is not unusual for a plant to bear as many as fifty flowers. These beautiful flowers seem to be at their best when the heat and drought of July and August have parched the lawn and the spring-flowering perennials have long since disappeared from the scene.

Daylilies are especial favorites of week-end gardeners because they thrive with a minimum amount of care. They definitely dislike heavy applications of fertilizers, preferring conditions as they find them in the ordinary garden. They especially like the cultural practices of the organic gardener. Even after the flowering season is ended and the flower stalks have been removed, the daylilies are decorative as the grassy green foliage makes attractive mounds of green. Although most of them lose their leaves in the fall, some tend to be evergreen and give promise through the winter of another summer made colorful with their blossoms.

Hemerocallis-Patricia

Hemerocallis-Bagdad

Species

A number of the species of daylilies deserve a high rank among garden plants. *Hemerocallis flava,* commonly known as lemon daylily, is early flowering and the lemon-yellow flowers are odorous. Other yellow-flowered daylilies are *H. minor* which is small and has grass-like leaves, and *H. thunbergi,* which does not bloom until early July, thus extending the blooming period of

the yellow varieties well into the summer.

The common roadside daylily with tawny-red flowers is *H. fulva,* which includes the well-known types such as Kwanso, Flore-Pleno, and Variegata. For the rock garden, the low-growing and dwarf types of *H. dumortieri* and *H. minor* are recommended.

Hybrids

With few exceptions, the species of *Hemerocallis* briefly described above are surpassed by the new hybrids. Hundreds of seedlings of hybrid origin are being grown and selected. These provide the gardener with a wide diversity in types in respect to habits of growth, season of bloom, range in color of flowers, and in size of the flowers. It is possible to have daylilies in bloom in the garden from spring to fall. Most important of all is the wide range of flower colors from light yellow through golden, copper, bronze, salmon, red, maroon, to purple. Many flower colors are light-proof and storm-proof. The flowers of some of the new hybrids remain open evenings. Daylilies can be grown in practically all parts of the garden except in wet or swampy places and in dense shade. They are especially valuable for keeping the garden colorful in midsummer when so many gardens show a lack of color. In making selections of the new daylilies, the gardener should first visit a nursery and see the plants in bloom. This is especially advisable for the fulvous and red-colored daylilies which are now being introduced in large numbers.

Hemerocallis—Dauntless, Midas
Daylilies at the Falls, a Garden Picture.

Culture

Daylilies thrive in almost any soil, and may be grown in all climates from Panama to Alaska. They may be established in naturalistic plantings as on dry rocky slopes, banks of streams or ponds, or anywhere except in swampy land which is constantly saturated with water and in dense shade. They may be planted at almost anytime the ground is in condition for planting. An old plant may be divided into sections of convenient size having at least one bud of the crown and some roots. In the garden a planting of daylilies may be left undisturbed for several years. When the plants become crowded to such an extent that the central part of the crown is pushed up, it is time to take them up, divide them, and reset the divisions to grow into new plants. The separation of old plants pays big dividends, as the rejuvenated plants will be much more vigorous and beautiful. With reasonable care, daylilies may be transplanted at any time, but the best time for this is in early spring before the season's growth begins. Be sure that the ground level is not more than one inch above the crown.

Daylilies are excellent for creating garden pictures. Select those which will blend in with the other plants in any particular part of the garden. Also in grouping the daylilies, care must be taken to select varieties that will have harmonizing colors.

POISON SPRAYS MEAN POISONED PLANTS

By JOHN KAISER

IN EVERY section of the country our farmers are spraying or dusting deadly compounds on practically every vegetable sprouting within the earth and on all fruits that hang upon a tree or grow upon a vine. This has been the practice in America for more than fifty years. I know the beginning because I was a member of the crew, headed by a staff from the University of Illinois, that made the first test of poisonous spray on an apple orchard. As I write this more than fifty years later I have in front of me a folder advertising some forty odd poisonous sprays and dusts to be used on fruits, vegetables, and flowers for the purpose of warding off disease or killing insects and weeds.

Through the years I have learned that unless poison-sprayed or dusted fruits and vegetables are thoroughly washed or peeled before eating the chances are in favor of the eater getting some of the poison into his system. But knowledge has never been a power strong enough to cause our farmers and chemical companies to see danger ahead.

However, that is changed now, for here we have a case in Federal Court where a father and mother file a damage suit against an orchardist, claiming that arsenic he had sprayed on the apples he sold caused the death of their son who ate of the poisonous fruit.

This is a case that should be watched by every American citizen. If the Federal Court decides that the apple in question was arsenic-poisoned, but not in sufficient amount of poison to kill the boy, as charged by the father and mother, or that it would be impossible to death-poison an apple by spraying arsenic on it, then free rein is given the farmers to use poison on their crops as they please. On the other hand, if this court decides, according to the evidence presented that the boy's death was due to eating an apple sprayed with a deadly poison by the orchardist, then the death knell is sounded for the use of poisonous sprays and dusts on vegetables and fruits.

However, no matter how one may feel about the merits or dismerits of this case, or of the verdict the Federal Court may render, the question of whether or not the use of poisons on growing vegetables and fruits is detrimental, injurious, or dangerous to health is not for a court of law to decide. It is for a court of doctors: scientists, those who hunt for microbes and germs, those of the soil, of plant growth, of plant life to make the decision. It should be placed in the hands of the U. S. Department of Agriculture and our agricultural colleges with their combined laboratories, farms, and gardens. The prime purpose should be to ascertain the danger that lies ahead, and, if danger to health is found to be there and poisonous sprays and dusts are absolutely necessary to preservation of our vegetables and fruits, then turn all effort toward finding compounds deadly to insects and diseases, but harmless to humans.

Also in this connection, if such is ever done, our court of non-lawyers should take up the question of commercial fertilizers: to decide just how much, if any, they poison the soil, if they leave a residue that is poisonous, that vegetables and fruits absorb or take up these poisons, thus making vegetables and fruits detrimental, injurious, or dangerous to health..... the whole research project based upon the fact that *the food value of all vegetables and fruits can never be greater or less than the purity and strength of the plant food to be found in the soil in which grown*, plus the further fact that *soil can be made to bring forth the highest quality of health-giving food without the use of poisons.*

Surely the time is now for science to take over and stop America's rush toward suicide. Maybe the decision of this Federal Court will start the ball rolling.

Short Cut To Ripe Tomatoes

According to Father Bernard Kocher of St. Joseph's Rectory, Hinton, Iowa, tomatoes from cuttings blossom and fruit in a much shorter time than plants grown from seeds. He removes the lateral branches from the stem, and roots them before setting them in the soil. Within a remarkably short time the plants from such cuttings begin to bloom and set fruits. It is important, however, to prevent the plants from fruiting until they have made sufficient plant growth to grow an abundant crop of fruits.

THE STATELY LUPINE

Lupines are beautiful soil-improving legumes.

By HOWARD A. KAUFFMAN

OUT OF the flower world comes the question, "Want to gamble?" Said I, "Yes sir, I'll take a chance!" The bravo cautioned, "Very well, here's the proposition—try lupines—but remember, while you may grow flowers of exquisite beauty that will feast your eyes, on the other hand you may experience failure." "I remember," I said, and started with gusto. So for a few years I have tried lupines. They seem to be a sort of a biennial so that you had better be fortified with some young plants every spring just in case. What kind of lupines? Russell's and all colors.

Raising lupines is as fascinating as the anticipation of angling; you go forth hoping to secure a nice string of the finny tribe and then you compromise with fisherman's luck. The real flower enthusiast has stamina, he tries again.

Lupines bear pea-shaped flowers closely placed on long, hollow, stiff spikes. Practically all the flowers open at one time and make a gorgeous showing. They reach a height of from three to five feet with the blooms over a foot long. They come in many colors of white, maroon, purple, yellow, red, pink, and blue, and with combinations of colors.

The general soil recommendation calls for a sandy or light soil. In the heavy clay the roots rot frequently. We live in the country in a hilly section of southern Indiana and have a rather heavy clay soil. I have grown my lupines in a space two feet wide between the sidewalks and the east side of the house. It is a heavy, cool, clay soil. I have incorporated into this soil a lot of old cow manure in the first four inches. I have noticed that the plants like plenty of moisture with good drainage. My plants being located by the east kitchen door, I give them extra water instead of throwing it in the drain. I have mulched them with some peat moss but it is expensive and difficult to secure here.

It is easy to save a lot of ripened seeds and they do not cost two cents each. Before sowing in the spring, soak the seed in some water overnight to soften the shells. Sow the seed one-fourth of an inch deep in specially prepared soil that will not bake. Put a piece of wet burlap over the area and keep it moist. When the plants appear above the soil remove the burlap. Lupines have a wonderful root system, a taproot with a few big prongs. They resent transplanting, therefore I plant small plants at a favorable time and see to it that there is plenty of earth adhering to the roots. Do not let them know that you are transplanting them and success is yours. If you follow simple instructions, usually you'll be rewarded with some blooms that will make your neighbors say, "Ah!" and "Ooh!"

Lupines with their spikes of brilliant colors.

A BOXER FINDS ORGANIC GARDENING TECHNIQUES EFFECTIVE

Mulch and compost insure success.

By JEROME L. FISHER

IN THE world of fisticuffs the ability to deliver a "one-two" punch sometimes spells the difference between picking up the prize money or finding yourself flattened out on the canvas. Maybe it will seem like a prodigious leap from the prize-ring to my week-end garden, but it seems to me that the favorable results that showed up in my raspberry patch last summer were also the product of a "one-two" combination. It was the combined effort of two procedures that put me considerably farther out in front as a berry grower than I had any right to expect.

The soil on my New England place is known to the soil Conservationists as Narragansett stony loam, which is my idea of a considerable understatement insofar as "stony" is concerned. The use of the word "loam" seems to be nothing more than a governmental attempt to curry favor with the voters! I would not, however, expect the scientists to describe my land in the same unsavory terms that I use when trying to plant an apple tree where a boulder is intent on remaining. There is another characteristic of my soil that brings a snicker out of me whenever I see a seed-catalogue reference to the need for good drainage. Drainage is what I have "the bestest and the mostest of" on my week-end place. I don't know if there is such a thing as a sieve with a six-inch mesh, but if there is, the drainage factor of such a utensil would approximate that of my kitchen garden and flower border.

The sensible thing to do with land like mine is to let it grow up in brush or give it back to the Indians. But I'm too stubborn to let the woods take over, and the Indians in our part of the country are too smart to have anything to do with the proposition.

The only alternative seems to be the use of generous quantities of compost, and I am now convinced that no planting operation will succeed on my place unless it is preceded by heavy applications of manure or compost, preferably the latter in order to extend the former.

But let's get back to the raspberry planting I made in the spring of 1948. I was determined that each plant should be set only after a hole had been dug that would take two good shovelfuls of compost. Since I was going to set only fifty roots, this may not sound like a very heavy assignment. It must be remembered, however, that my anemic layer of topsoil covers a selection of rocks and boulders, many of which approach the size and sluggish disposition of a baby-grand piano. But in spite of all obstacles the holes were dug in accordance with the original specifications, and, as so frequently happens in this week-end gardening, I was glad to get back to the city to rest that aching back.

Every one of those raspberries was eventually set in a right generous quantity of compost. And that was the No. 1 punch! The season that followed was a fairly droughty one, but in spite of that the planting did reasonably well. However, when the autumn of 1948 rolled around, I followed up my advantage with my punch No. 2, the cross-over blow that brought results.

I have on my place about three acres of unused land that produces an annual crop of the coarse broomsedge that takes over most of the abandoned farms in these parts. Last fall I had this cut, and piled it a foot deep all through my raspberry patch. Some left over was used for mulching strawberries and the rest was put through the compost pile.

This coarse hay mulch together with the compost application is responsible for what success I have had with my raspberries during the past season. And here in Southern New England children weep and strong men shudder at mention of the growing season of 1949! The drought we experienced was the granddaddy of them all. For months on end our gardens were refreshed by nothing more substantial than an occasional heavy dew!

Most of my gardening for 1949 was a complete flop. Ripening strawberries and the plants, too, dried out and turned up their toes after only one week of picking. Vegetable seeds never germinated, and the onion sets that I planted the latter part of April sent up their first green shoots the next September.

Sure, some form of irrigation would have spelled a difference, but with a week-end place there are definite limits on time as well as energy. And with very few exceptions it is my intention to depend upon natural rainfall. The trick then seems to be to see to it that each plant has below the roots a kind of soil that will hold moisture for a reasonably long time, and then it seems necessary to protect the surface of the ground from the beating attacks of the hot summer sun.

I am satisfied that my raspberry planting has proven the worth of such a program. Growth of new canes during the past season has not by any means been phenomenal, but a very substantial growth did come through. In spite of the nature of my soil and in spite of the worst drought on record, I have high hopes of being able next summer to sit down very often in front of a heaping bowl of raspberries and cream. If just a fraction of the new canes carry through the winter, my cellar will bulge next year with raspberry jam.

What I have said of my raspberries is largely true also of my blueberry planting. (By the way, after ten years of week-end gardening, I am learning to settle for the type of plant that feels reasonably happy in my kind of soil.) The blueberries had a small amount of compost to stick their feet into, plus large quantities of ancient sawdust. From the beginning they have had a heavy mulch of sawdust. They also were planted two seasons ago, and despite the past unfavorable season they are sporting a new growth that indicates that they are beginning to feel at home.

I was able to prove last summer just what kind of job was being done by both the hay and sawdust mulches during the worst of the drought. Whenever I would pull out a weed that had pushed its head up through the mulch, I found that the soil that came with the roots was decidedly moist. And this was at a time when my lawn was brown, my vegetable garden a complete failure, and when there was not an earthworm to be found in the whole County—except around my berry plants!

Too many things can happen in this gardening business for me to make any rash predictions of what's to come. But it does look to me as if I would have considerably better chances of coming through next season with a reasonably good garden, if I practiced that "one-two" punch in all my garden activities.

Raspberries that grew luxuriantly in Southern New England in spite of severe drought —MULCH.

JULY GARDEN CALENDAR

By WILLIAM H. EYSTER, PH. D.

JULY is an important month in the garden. Your cultural practices have been brought into expression sufficiently for your garden in July to serve as an index of your garden success. If your soil was well prepared, abundantly enriched with compost and raw minerals, your garden plants will be vigorous, healthy, and prolific. July also is the time to look ahead to the fall garden and to the growing of root crops for winter storage.

Flower Garden:—Continue pinching off the lateral shoots of the chrysanthemums and dahlias if you want fewer but larger flower heads. Delphinium, phlox, and bachelor's button should be cut back heavily to induce new growth for fall flowering. Also cut back nepeta, violets, and forget-me-nots to four inches. Hollyhocks and veronicas will bloom a second time if the old flowers are removed so that they do not develop their seeds. Keep the old flowers cut from baby rambler roses to keep them in bloom all summer. Pinch back boltonia and hardy asters early in July to keep them bushy.

To insure an abundance of color in your flower borders, interplant with coleus, pelargonium, and begonia. Annuals may still be planted in July, especially lupines, balsam, portulaca, Shirley poppy, torenia, zinnia, godetia, Drummond's phlox, mignonette, and Virginia stocks. It is not too late to make another planting of gladiolus for fall flowers. Columbines may be seeded in coldframes, but do not expect seedlings for a month or more, as germination is slow. It is time also to sow seeds of Canterbury bell and foxglove.

July mulching controls weeds, feeds the soil, conserves soil moisture, and protects the soil from erosion and from being splashed on the flowers. Give peonies a liberal application of compost. Cosmos will appreciate a light application of wood ashes as the bushes are coming into flower.

Perennials should be staked if there is danger of their being broken down under the weight of their flowers. It is time to order your bulbs for fall planting. Renew old lily-of-the-valley beds. New pips may be reset in the same bed after it has been given a liberal application of compost.

Shrubs and Trees:—Roses should be examined for sucker shoots, which should be removed. The wisteria should be given a heavy pruning. See that your spring-planted trees and shrubs are well mulched. Water them whenever necessary.

Vegetable Garden:—Plant vegetables for fall use and winter storage—cabbage, endive, carrot, beet, Chinese cabbage, peas, potatoes, celery, lettuce, sweet corn, spinach, and others that will provide food for the autumn table and winter storage room.

West Coast

Flower Garden:—This is seed-sowing time for pansies and violets. Other seeds that may be sown now are calendula, centaurea, clarkia, cynoglossum, dimorphotheca, scarlet flax, godetia, larkspur, Iceland poppy, linaria, nemesia, schizanthus, snapdragon, winter stock, and winter sweet pea.

If your July garden lacks color, now is the time to plan the improvements for next year. Some suggestions are leucophyllum with silvery blue-flowered moraea.

Continue to disbud the chrysanthemums and dahlias for large heads. Lupines which are cut back immediately after flowering will make new growth and often bloom a second time. Plant the pansy beds with verbena, dwarf petunia, or annual phlox.

Shrubs and Trees:—Rhododendrons, azaleas, and other ericaceous shrubs should be mulched with compost and leaves but never cultivated. Your annuals and perennials will also be benefited by a mulch which prevents weeds and conserves moisture.

Vegetable Garden:—Plant vegetables for fall use including practically all salad, flavoring, and vegetable plants, and such root crops as beets, radishes, and carrots. Still time to plant sweet corn, peas, beans, and potatoes.

The South

The South is made beautiful in July by oleanders, crepe myrtles, hydrangeas, rose of Sharons, and magnolias.

Flower Garden:—Hardy phlox in white and all shades of red are re-

markably heat-resistant and should be in every garden. Shasta daisies lighten the heavy shades of salvia and torenia. Keep all dead flowers cut off your plants to prolong the blooming period. The hardy chrysanthemums should be pinched back consistently to produce low, bushy, free-flowering plants. Be sure to have buddleias and abelias in your garden. The poinsettias should be cut back to about two-thirds their present height to encourage branching. The clipped branches may be rooted and grown into new plants for potting and growth indoors. Plant daffodils, bearded iris, madonna lily, and gladiolus. Lotus and water lilies are worth while in the pond. Make repeated sowings of annuals.

Shrubs and Trees:—Oleander and gardenia cuttings should be made. Reproduce by layering tea olive, camellia, and the broad-leaved evergreens.

*The Southwest**

Conservation of water is of paramount importance in the semi-arid Southwest; and during the almost rainless months of July, August and September we should make every drop count. If one is to succeed with summer gardens one should be conversant with all the methods of saving water both old and new. Techniques are constantly improving, and there are more than a dozen good ways to apply water economically. The University of California issues instructive bulletins and circulars which a one-cent postal will bring you. Circular 134, Lawn-Sprinkler Systems, by J. E. Christiansen, is very helpful. Address your requests to the Agricultural Extension Service, Geannini Hall, University of California, Berkeley 4, California.

Humus is a great moisture conserver and constant mulching prevents surface drying out and evaporation as the pitiless hot sun beats down day after day.

Flower Garden:—When temperatures frequently soar to 90° and over, sow the heat-loving annuals where they are to bloom and thin out as soon as possible. By nature, their moisture-seeking roots resent transplanting. Cosmos of many types, annual gaillardias, French and African marigolds, tithonias and zinnias can be used. From the useful plant bands and other containers set out chrysanthemums, dwarf Unwin dahlias, blue marguerites, white and yellow marguerites, pentstemons, perennial gaillardias and petunias. For shady locations use begonias, Japanese anemones, browallia and nicotiana. The reliable semperflorens or wax begonias are invaluable for either sun or shade. We do not make enough of our evergreen bulbs and tuberous rooted plants in our climate, where they are at home in the open and need not be grown in the greenhouse, laboriously dragged down cellar, or carefully and deeply mulched if left in the ground. Such standbys as the agapanthus, the stately albucas, the beautiful shell-pink *Amacrinum Howardii*, the aristocratic clivias, the tropical and semi-tropical crinums, the blue-berried dianellas, the ever-blooming dietes, the well-known kniphofias and the hardy evergreen daylilies can be planted now. Some of your early deciduous bulbs can be dug and divided, and your South African and native bulbs should be allowed to dry out. Bearded iris may be transplanted at this time. July is a good month to get a start with winter-flowering annuals, such as tetra-snapdragons, stocks, calendulas, pansies, and violas for early September transplanting. Flats are plant-killers; use instead protected seed-beds watered by special sprinklers. Perennials advised for May and June may still be sown.

Trees and Shrubs:—Ornamental trees and shrubs may be planted throughout July if care is taken to have plenty of water down underneath and well-mulched basins. The same applies to roses and semi-tropical fruits. We should make hedges of fruiting shrubs instead of using useless soil-robbing privets. What is finer than hardy Meyer lemon, lemon guana, pineapple guana (*Feijoa Sellowiana*) and wonderful pomegranate? Get acquainted with the fine calamondin (*Citrus mitis*), a cold-resistant species which bears hundreds of fine juicy fruits and makes a fine ornamental for your home garden. Potted plants should be watched continually to see that they do not dry out. Use the reliable long-lived redwood containers wherever possible. Do not fill the pots too full, but leave considerable room for a good mulch or top dressing of compost, leafmold or Georgia peat. Small pots can be set inside larger pots with layers of sphagnum or peat to keep delicate plants in good condition. Camellias, azaleas, and their shade-loving companions should be watered on schedule. When the camellias and azaleas are forming buds, hose them off on extra-hot days. Be sure that your young fruit trees have their trunks protected from sunburn. Use tree whitewash and any of the regular protectors on the market. Your berries may be pruned as soon as they have finished bearing. Leave from five to seven strong canes to each plant and let them lie flat.

Vegetable Garden:—At this time you can set well-grown plants of tomatoes, eggplant and pepper. Prepare the holes thoroughly digging deep and enriching with compost. Activate all soil with Humisite which is rich in bacteria and humic acid. Try the yellow Jubilee tomato. It is an excellent time to plant beefsteak tomatoes which do not set until the hotter weather commences. Fill all holes with water three times before planting, put a good mulch on top, and you will have little trouble raising good tomatoes. The Hungarian pepper is one of the best hot ones. If you want to make your own tomato paste, use the Marzano or Italian paste tomato. Continue planting summer squash, string beans, pole beans, soy beans, cucumbers, sweet corn, melons and such cool-weather crops that can take the heat as chard, carrots, beets and

(*Continued on page 57*)

* Charlotte M. Hoak, 1125 Stratford Ave., South Pasadena, California

SEWAGE SLUDGE

Every community should return sewage sludge to the soil.

By GORDON E. JACQUART

FOR the past several years the writer has used dried sewage sludge for everything that grows. Large piles of this material had been thrown out of our local sewage plant and used for filling lowlands. I sensed the waste of this valuable organic manure, and spent weekends hauling it to my backyard.

Others had attempted to incorporate the dry cakes of sewage sludge directly into the soil, with varying results. Some claimed that the cakes failed to disintegrate readily and turned up in the next year's plowing almost intact. Still others would attempt to use the sludge for fertilizer only to discard it after some uninformed friends threw up their hands in horror and promised dire unhealthy results from the use of such waste matter.

At first I used the broken-up sewage sludge cakes as a mulch for shrubbery and flower garden. Although it just lay there the first year, I tried the following spring to stir it into the soil and found that most of it had already incorporated with the top six inches of soil which was teeming with earthworms. The shrubbery and flowers were healthy and vigorous.

That fall I began using the sludge cakes in the compost pile with excellent results. In no time at all the sludge was pulverized and lost its identity. The resultant compost was a greatly improved compost that has made the garden a thing of beauty. I found also that an excellent mulch is made by mixing sewage sludge with sawdust and sand and melting the mixture in a pile, allowing it to stand for a season.

Earthworms seem to love sewage sludge. I had several piles about the yard which lay there over the winter. In the spring I moved these and disturbed thousands of fat earthworms. This induced me to try the sludge in earthworm culture boxes. They thrived in this like nothing else tried before. It seems that I am continually splitting the culture boxes now to prevent overcrowding.

There must be thousands of tons of sewage sludge from small sewage plants that are wasted annually, when it could all be used beneficially. I believe that organiculturists should start now everywhere to see that their cities, small or large, install sewage disposal plants. They then can form non-profit corporations to process and handle the sewage sludge, with the financial gain going toward financing the sewage plant operation.

Our small sewage plant serves only one hundred and fifty families, yet it produces enough sludge for every gardener in our little community. It also prevents stream pollution, which is otherwise a necessary evil when sewage is wasted into nearby rivers and streams.

It is my firm conviction that the organized efforts of organiculturists would make it a reality for every community in the nation to own and operate a sewage disposal plant. This would immediately stop the tremendous waste of valuable organic material and would halt the terrific pollution of our streams, rivers, and lakes. From this beginning would stem the promotion of sludge as a fertilizer for general use. Here the organized organiculturists would again step in and either influence their cities to process and sell the sludge, or form non-profit corporations to process it.

Community sewage sludge beds

BLUEBERRIES

Native shrubs for ornament and fruits.

By LEWIS E. THEISS

WHY so few persons grow blueberries in their gardens is a mystery, especially when blueberries have everything to recommend them as a home plant. No berry is more delicious, none brings higher prices. The plants are easy to grow. If properly handled, they produce abundantly. No shrub has more beautiful foliage in the fall. None can be used with better effect in landscaping the home grounds.

In landscaping my own grounds, I have always worked on the theory that one might as well use productive plants rather than plants that are merely pleasing to the eye, especially in view of the fact that there are many productive plants of the utmost beauty. Thus I have used nut trees, currants, gooseberries, blueberries, and other productive plants where commonly one sees maples or oaks or barberries and the like.

Furthermore, unless you have eaten fruits and berries that were dead ripe and just picked, you have no conception of the high quality inherent in such food products. Vegetables and fruits bought in the market may look very attractive, but usually the appearance is deceptive. Anything that must be shipped to market may also be picked while it is, to some extent, green and hard. Otherwise it will not withstand the handling. Fruits and berries get the major part of their sugar content in the final thirty-six to forty-eight hours before being separated from the mother plant. Commercial products *must* be picked before they are really ripe, and while they are still hard and firm. Thus they do not contain the flavor and quality they would have if they remained on tree or vine for another day or two. In the market they may color up and become soft, but they never attain highest quality. One gets that only in home-grown products that can be left on the plant until they are dead ripe. As for cost, blueberries are selling in small-town markets at this time—summer of 1949—for 55 cents a quart. So one can afford to spend a few dollars for blueberry plants.

Instead of setting forth something about the *theory* of blueberry culture, let me tell briefly of my own experience with these plants. As a plant experimenter for the United States Department of Agriculture, I worked for twenty-five years with innumerable varieties of growths, including blueberries. As an experiment, I got two men and a truck, and having obtained permission from the owner of the land, went up into the near-by Pennsylvania mountains in the autumn, and selected twenty-five blueberry bushes. As they were not then in fruit, I chose the best-looking, most vigorous plants I could find. Thus I knew nothing about the sort of berries they would bear, or whether they would bear berries at all.

Running from the road to my garage is a curving driveway that might be seventy-five feet long. I set these bushes on the side of that driveway farthest from the house, to form a hedge, with a second row of bushes a little farther back from the driveway. I set the plants six feet apart. That, I discovered, was a mistake. They should have had more room. At any rate, they took hold, grew, made a beautiful autumn appearance with their attractive red foliage, and presently bore berries.

Heavily mulched with sawdust these blueberries show signs of having become established.

Fruit clusters of improved blueberries.

My thought was to fruit them, keep such bushes as produced worthwhile fruit, and graft the remainder with scions of superior, cultivated sorts. A friend of mine who owned a large tract of mountain land near Harrisburg had similarly set out hundreds of native plants and grafted them. They prospered, and soon he had a very productive plantation. But before many years the grafts began to die, and the bushes sent up shoots from the roots, so that he was fast getting back to where he started, with inferior native berries. Perhaps that would not happen elsewhere, but it was startlingly suggestive.

I gave up the idea of grafting my native plants and began to dig up and throw away such bushes as produced undesirable fruits. Two or three at a time, I purchased from nurserymen blueberry plants of the best cultivated varieties and set them out. Presently I had eight varieties of the cultivated sorts. These included such kinds as Rubel, Concord, Rancocas, Jersey, Cabot, and others.

I was fortunate in that a part of the area planted was a little boggy. Some of it, on the other hand, was hard, dry wornout soil that baked as hard as a rock. This situation was excellent for my experiment. Blueberries must have ample moisture. On the other hand, they cannot stand "wet feet." Where they grow in swampy areas they stand on hummocks, and their roots grow down to the water. At any rate, in the boggy portion of my little plantation ample moisture was assured. But what about the hard, baked area?

There I at once began to apply heavy coatings of mulch. This dry portion adjoined a little field that we own. When the grass in that field was just ready to go to seed, I mowed quantities of it and carefully packed it about the little plants. Year by year I did this. The mulch, decaying, had entirely altered the nature and condition of the soil, and has of course made the ground more sour. Sour or acid soil is an absolute necessity if one is to grow blueberries successfully.

The blueberry is a plant that has been under cultivation only a few years. But for untold centuries it has lived in the sour soil of woods and swamps. Therefore, it simply cannot tolerate sweet soil. So lime must never be used about a blueberry plant. Growths that have been under cultivation by man for long periods, and have thus often come into contact with soils that have been limed, acquire a tolerance for sweet soil that blueberries do not possess. A fish out of water is in much the same plight as a blueberry in sweet soil.

Soils can be made sour artificially, but probably the best way to do it is to create a thick mulch of leaves and grass, etc., and let this mulch rot year after year. Also, apply compost. These measures will assure both the proper quality of the soil and an ample moisture supply.

But do not pack mulch tight about the stems of your plants. Leave a bare space several inches wide around the stems. Mice sometimes harbor under mulch and work under it. In winter, if the mulch extends close to plant stems, they will eat the bark from the stems and probably kill the plants. Mice can be discouraged by occasionally stirring the mulch with a pitchfork.

The greatest difficulty I experienced was with rabbits. Even a three-year-old blueberry bush from a nursery is a small plant. Winter after winter rabbits cut down my cultivated blueberry plants. In town, one is less likely to suffer from rabbits,

although it is surprising how many rabbits and other wild animals harbor in small communities. At any rate, rabbits set my blueberry bushes back seriously for several years. When the lower stems were big enough and tough enough, the rabbits let them alone. But if we had deep snows, the rabbits would get on the crust and thus be able to reach the young terminal shoots, which they promptly removed. As my plants were at my country home, I was not there in winter and so could not shovel the snow away from about the bushes. If rabbits prove harmful, a little snow shoveling would probably prove helpful. However, some snow should probably be left on the ground for root protection.

Blueberries of the current season are borne on wood of the previous year's growth. To be productive, therefore, a blueberry plant must have plenty of new wood. One way to secure this is through judicious pruning. When a branch or a stem of a plant is cut away, nature tries to restore the balance between roots and leaves by making much new growth. Old, hard stems naturally produce less growth. Thus if one cuts away an old stem or an old branch or two, the effect is to make the plant produce a considerable amount of new wood. Thus trimmed, and kept well mulched—which is just a method of providing both food and water for your plant—your bushes should be vigorous and productive. But don't overdo the pruning. A little, regular yearly cutting is best.

Blueberries like sunlight. Unfortunately, I had to plant mine where there was too much shade. I have been remedying that by pruning away offending tree limbs as I found time to do it. However, some shade may be useful. In all probability, shaded plants ripen their berries more slowly than those in full sunshine, thus prolonging the bearing season.

We probably have blueberries during a period of six to eight weeks. The native bushes I brought in vary greatly in respect to size of fruit, quantity produced, and the way the fruit ripens. I kept one bush because of its extreme earliness. The berries are small, but they come some days ahead of any others in the plantation. When you buy plants from nurserymen, you can select early, medium, and late varieties. It is wise to do so. One of our late varieties is Jersey. The berries are large, the production is generous, and the bush is a vigorous grower. Incidentally, it stands in that area that was hard barren ground.

Blueberries undoubtedly need cross-pollination. Incidentally, probably all plants produce better where there is cross-pollination. This is worth bearing in mind. Therefore you should have at least two varieties of blueberries and preferably more. If you have early, medium, and late sorts, you should have an abundance of fruit and the season should extend over a considerable period.

Do not put artificial fertilizer or manure on blueberry plants. In all probability, the closer you come to duplicating nature in your handling of these plants, the better will be your success. Mulch and compost are natural methods. Probably millions of young apple and pear trees have been frightfully harmed by fire blight simply because they were fertilized and cultivated too much. Many folks think that tremendous growth is a sure sign of vigor and health in a plant. They forget that

Improved blueberries are large and prolific

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HERSHEY ESTATES

HERSHEY, PENNSYLVANIA

nature sets the pace at which every plant should grow. When plants are forced to make unnatural growth through heavy fertilizing and continuous cultivation, they of course, grow amazingly and look wonderful. But the growth is not a hardy, sturdy, natural growth. The wood is soft and succulent—just exactly what the spores of fire blight are seeking. No doubt this rule holds true elsewhere: tne nearer we imitate nature, as in the use of mulch and compost, the better will be the results.

The only pests I have observed on my blueberries during a period of fifteen years or more were occasional caterpillars and a few stem borers. The caterpillars are easily picked off and destroyed. The stem borer eats into a terminal shoot and quickly kills it. The dying leaves promptly betray the presence of the borer. A sharp knife quickly removes both stem and borer. Do not spray blueberry bushes. They still have most of the hardiness they have developed through centuries of struggle for existence. Sprays and dusts may kill insects but they also lessen a plant's power of resistence to enemies. A coddled plant is no different from a coddled child.

It is impossible to predict the crop of any blueberry bush, although nursery plants, grown from cuttings, should possess the bearing characteristics of the parent plant. Certainly a well-grown blueberry bush should produce several quarts of berries. One of the bushes I brought in from the woods is a priceless jewel. In a good season I have taken more than twelve quarts of berries from it. The berries ripen one after another, so that there are always great clusters of berries containing some that are fully ripe and some that are still green. A bush like that is very valuable to a home owner. A professional grower might prefer bushes that ripen all the fruits at the same time.

Blueberry bushes grow slowly. That may be one of the reasons why they are high in price. A year-old plant is usually so small in size that it hardly pays to plant it. Even a three-year-old plant is relatively small in size. But it should soon come into bearing. As they grow older, the bushes seem to grow faster. So don't be discouraged by slow growth at the start.

Blueberries, or any other productive plants, should not be planted along the highway or street side of a property. That invites spoliation. But for marking division lines between yourself and a neighbor, or for a bushy background or low screen or hedge within the home grounds, blueberries are excellent. If they are crowded together, the bushes will reach up for sunlight, as mine did. They may reach a height of seven feet or more. Some of mine are so tall that I have to sit on the top of a stepladder to pick the berries easily. But bushes properly spaced and pruned can easily be kept to a desirable height.

On my grounds here in central Pennsylvania, we have strawberries, raspberries, wineberries, Boysenberries, blackberries, and blueberries. Strawberries begin to ripen in early June. Raspberries follow promptly. Today is July 13. The raspberries are about finished. Boysenberries are at their peak. So are wineberries. To date I have picked eleven quarts of blueberries. For weeks to come, there will be ripe blueberries on the bushes. Long after all the other berries have gone, there will still be blueberries. Although I have never kept figures on actual production dates, I believe the blueberry season extends over a much longer period than that of any other berry. At any rate, it is a great satisfaction to be able to step out at any moment during a long period—especially when unexpected company arrives—and pick a quart of luscious blueberries. From my point of view, my little blueberry plantation is worth several acres of barberries. The blueberries make a pleasing hedge, they are extremely beautiful in the fall, and they yield berries of the most delicious sort. Surely the blueberry is a plant for the home owner to include in his plantings.

MISCELLANY

By J. I. RODALE

The Insect as a Censor

IN THE *Hutchinson News Herald* (Kansas) April 28, 1950 appears an item in Bill Bork's farm column and I will quote:

"James Turner, five miles south of Sharon, has made an interesting observation during the current greenbug infestation.

"He has a 60-acre field of wheat, part of which has been in sweet clover. On that part the bugs have done no damage but on the 30 acres which have not been clovered, there is plenty of evidence that the pests are working.

"It may be that the wheat on the clover ground is larger and more vigorous and therefore able to stand the continual sucking of the insect but Turner says there just aren't as many on it. Maybe the greenbug just doesn't thrive on wheat growing on soil which has plenty of nitrogen in it. It seems to be that way with chinch bugs. They first attack corn or sorghum growing on soil with a low level of fertility. The big, rank crop down in the bottom is shunned.

"A Missouri entomologist has been working on that idea for quite some time and has come to the conclusion that sucking insects don't care for nitrogen in their diet.

"In his experiments, the entomologist fed chinch bugs on plants which were growing on nitrogen rich soil as well as on those that were deficient in this element. The latter group thrived better, matured faster and laid more eggs than those which were getting the food rich in nitrogen. Maybe here we have another argument for keeping up soil fertility."

This is in line with Sir Albert Howard's theory that the insect is the censor of nature to destroy unwanted vegetation. The insect seems to thrive where there is a nitrogen deficiency, or where a plant is stunted or sickly, or growing out of place. The Missouri entomologist referred to is Dr. Leonard Haseman of the University of Missouri who is a contributor to our other magazine, *The Organic Farmer.*

Early Asparagus

A visitor at our farm who came from the Bryn Mawr area near Philadelphia, was surprised to see asparagus perking their heads up above the ground in our stone vegetable garden on May first. Even though the Philadelphia area is warmer than ours at that date, and things begin to grow there earlier than in our location, he said that they would not have asparagus before the tenth or the fifteenth. We know this to be a fact, that we get earlier growing vegetables in our stone garden, due to the presence of the stones. See our book called *Stone Mulching in the Vegetable Garden.*

Chemical Fertilizers Harden

Here is a sad item sent in by one of our readers, an Associated Press dispatch:

One of Two Workmen
Buried in Cave-in Dies

Little Rock, April 27 — Douglas Archer, 21, of (Route 2) England, Ark., died, apparently of suffocation, when a pile of fertilizer caved in on him today.

Ulysses Robinson, negro, of Little Rock, also was buried by the cave-in, but survived. He was reported in "good shape" at Arkansas Baptist hospital here.

Police said the men were shoveling fertilizer at the Southern Cotton Oil Mill here when the accident occurred. They were buried for about five minutes before other workmen could reach them.

Mr. John P. Toberman who sent in the clipping accompanied it with a letter which was as follows:

Dear Mr. Rodale:

Attached hereto you will find a clipping telling of the death of one workman and the injuring of another at the commercial fertilizer plant at Little Rock, Arkansas, when trapped in a cave-in of the fertilizer they were preparing to bag.

What the article failed to tell came out in the radio newscast the following morning. It was this: From the newscast it was pointed out that when the chemicals nitrogen, phosphate and potash are mixed together they are blown into a LARGE room where in a very short time they form a solid, hard mass which has to be dynamited apart before bagging operations can begin. This was what these two men were doing when they were trapped by the resulting cave-in.

It is no wonder that when this chemical compound is spread upon your soil and the rains fall upon it you get the resulting "hardpan" formation which gradually becomes almost like concrete and in time you almost have to use dynamite to stir your once mellow soil.

When barnyard fertilizer became hard to get and before I learned about compost, I was advised by the "wise guys" to use chemical fertilizers on my greenhouse bench soil which, before the season was over, became so hard I could not stir it and the water would run off down between the side of the bench and the soil instead of soaking into the soil. I became desperate and finally woke up to what the trouble was and drove many miles out into the country to get the necessary humus. Then my worries were over for my soil became mellow again.

Yours very truly,
John P. Toberman

I am not offering this as scientific evidence to prove that chemical fertilizers harden the soil. We know of course that they do, and that the use of organic matter will invariably loosen it, but I am indebted to Mr. Toberman for sending in this item,

because it furnishes a picture which will stay before your eyes for a long time.

Prankster Anonymous

Every once in a while some reader of this magazine who is not in sympathy with the principles of organiculture sends in an anonymous letter poking fun at us. I am one who has always enjoyed a laugh upon myself and felt happy that I was the means of giving some other persons a few happy moments. Here is the whole letter unexpurgated:

As a B. D. farmer and a subscriber to Organic Gardening as well as Organic Farming I am interested in anything which will promote building humus in our soils by proper practices. Sometimes a sense of the ridiculous will accomplish what serious dissertations will not, and in this vein I offer:

"Morning Fantasy"

(Any resemblance to the truth is purely coincidental)

A good farmer friend of mine has a secret rite which he practices each Sunday morning for the good of his soil, and perhaps his soul. He goes out onto one of his fields early, when the earthworms are in a philosophic mood, digs down and brings one to the surface where he can talk to it. Stroking it gently on the back, he addresses it in serious tones. "You know" he says "we have a lot to do to get this field in shape—we must work hard, you and I." The worm considers this a moment, then turns himself into a question mark and sarcastically answers "*I* must?" Whereupon the farmer, gently holding him between thumb and forefinger, looks him squarely in the eye and uttering the incantation "Hu*mus*" pops him back into the soil.

All those who understand the foregoing should join the "Hu*mus* Club", to promote philosophical earthworms, for "Hu*mus* cultivate the lowly worm."

Anonymously offered

Doings in Congress

Here is a most astounding item that appeared in the April 25, 1950 issue of the *Congressional Record.* It is by Hon. Usher L. Burdick, of North Dakota:

Mr. BURDICK. Mr. Speaker, a newspaper article recently written by the distinguished Representative from Iowa, the Honorable H. R. Gross, aroused my interest in a matter of vital concern to Iowa citizens.

I am surprised to know that the consumption of commercial fertilizer is increasing so rapidly in a soil known to be as rich and productive as the soil of the State of Iowa.

I am also surprised to know that a survey made by experts of the United States Department of Agriculture indicates that highly fertilized pasture lands may be the cause of the X-disease that has killed so many cattle, and forced some cattle men to give up the cattle-raising business.

The thing that shocks me most in connection with this matter is the fact that fertilizer money is being used to subsidize the research work of the Bureau of Plant Industry, and these gifts of fertilizer money are believed to be responsible for keeping the people in the dark as to why it is necessary to use so much fertilizer per acre, and how the excessive use of soluble nitrogen affects the health of both man and animals.

The purchase of the influence of public officials is a blow at the foundations of popular government.

I am strongly in favor of the appointment of a special committee to make a careful study of the extent of this corrupting influence, and the effect of present methods of fertilizer manufacture on the health of the people.

The Honorable H. R. Gross rendered a service to the people of his State when he brought this matter to their attention in his newspaper articles in the *Tripoli Leader,* and other newspapers in that State, and he is to be commended for his interest in the welfare of the farmers.

Since the article in the *Tripoli Leader* throws considerable light upon this important matter, I insert it in the *Record* as a part of my remarks:

Congressman Gross' statement reads as follows:

Makers' Malpractice Double Costs of Farm Fertilizers—Letter to Congress Raps Industry for Hiking cost $250,000,000.

(By Representative H. R. Gross)

Washington—Iowa farmers, who have more than tripled their use of commercial fertilizer since 1944 and who forked over nearly $16,000,000 for that product in 1949, probably will be interested in studying charges that it takes as much as two bags of fertilizer to do what one bag did in 1925.

The reason is not the soil or the farmer, but the fertilizer, according to sponsors of a bill that would regulate the registration, manufacture, labeling and inspection of fertilizer and fertilizer materials shipped in interstate commerce.

The charges are contained in the following portions of a letter written by William G. Holman, of 305 B Street NE., Washington, D.C., on March 14 to the National Fertilizer Association, and inserted in the *Congressional Record* on March 20 by Congressman Keefe, Wisconsin Republican, who introduced the bill, H. R. 3045, a year ago.

"Gentlemen: I have just read a statement by you in the March issue of the *Fertilizer Review* which reads as follows: 'We knew from the price indexes that the cost of a ton of fertilizer is higher today than it was in 1925. The actual figure is—let's see—8 percent; a ton of fertilizer costs about 8 percent more now than it did 25 years ago.'

"A statement by Mr. O. V. Wells, Chief Bureau of Agriculture Economics, United States Department of Agriculture, and published in the December 1948 issue of the *Plant Food Journal,* shows that your statement is far from being correct.

"Mr. Wells said: 'The Bureau of Agricultural Economics indexes indicate that fertilizer prices last fall were only 55 percent above the average for the prewar years, 1935-39,' and the Bureau probably did not take into consideration the facts that I shall bring to your attention.

"Namely, that the farmer is forced to use 50 percent more fertilizer per acre today than would be necessary if the fertilizer had contained the same proportions of water-soluble and organic nitrogen that it did prior to 1925.

"You failed to tell the public that prior to 1925, only one-third of the nitrogen in fertilizers was derived from water-soluble sources—such as nitrate of soda, and sulfate of ammonia—if we are to believe the source tags that appeared on the bags.

"The remaining two-thirds of the nitrogen was derived from organic sources, such as dried blood, fish scrap, animal tankage, and cottonseed meal.

"You probably know that Federal and State Agronomists recommended these proportions, and believed that one-third of the nitrogen from quickly soluble sources was as much as the plant could take up before some of it was washed in the soil water beyond the reach of plant roots.

"You know that when fertilizer was made this way, the average consumption per acre was three to four bags—and it grew tobacco that made Buck Duke and Dick Reynolds rich and famous.

"You also know that soon after the enactment of the Webb-Pomerene Act, a few fertilizer manufacturers acquired control of the phosphate market—see Federal Trade Commission Report—and that soon after that they compelled other manufacturers to increase the water-soluble nitrogen content of the fertilizer to 65 percent, and to reduce the organic nitrogen content to 35 percent.

"The farmers complained about this radical formula change, and soon thereafter, the State laws were amended. These amendments permitted the manufacturers to increase the total nitrogen content of all fertilizers 21 percent, to take source tags off fertilizer bags, and to use almost unlimited proportions of cheap, water-soluble sources of nitrogen without letting farmers know that this was being done.

"The radical reduction in the organic nitrogen content of the fertilizer forced the farmer to use at least 50 percent more fertilizer per acre in order to get enough organic nitrogen to feed his crop to maturity, and this increased the amount of the farmers' national fertilizer bill $250,000,000.

"The record shows that the National Fertilizer Association was indicted and fined $9,000 in a Federal court in North Carolina for violations of the Sherman Anti-trust Act, and for having exerted an undue influence on State lawmakers, and law-enforcement officials, and the attention of the Congress has recently been called to the fact that the fertilizer interests have been subsidizing the research work of the Bureau of Plant Industry.

"If I were in your place, and wanted the respect and esteem of the public, I would openly advocate the enactment of H. R. 3045 that will compel all manufacturers to be honest with the farmers; such a law would make it easier for State enforcement agencies to see that the farmer got an honestly made fertilizer, and would help to protect the health of the people."

Mr. Holman, writer of the above letter, has devoted himself to the fertilizer subject for years, and has served as consultant to a number of Representatives and Senators of farm States.

I would like to point out in connection with his statement on the $9,000 fine under the Sherman Anti-trust Act, that anti-trust laws will never be properly enforced until prison sentences, instead of fines, are meted out to violators.

The Soil and Health Foundation

We need ever to keep before us the purpose of the Foundation. This nonprofit organization was founded to

(a) Promote, foster and encourage the use of humus and other organic matter in order to maintain and improve soil fertility, to prevent soil erosion, and to improve the health of man.

(b) Conduct, engage in, foster and encourage scientific research and study and teaching, training, informing and educating the public on and concerning the soil, foods and health of man—and their relation to each other.

(c) Study the effects of organic and artificial fertilizers on soil, plants, animals and man.

(d) In order to accomplish the foregoing purposes, to establish, use, maintain and operate farms, schools, laboratories, experiment stations, publishing houses and all other appropriate agencies, means and instrumentalities.

The Foundation is carrying out the above purposes to the extent the contributed funds make it possible. Carefully planned and carefully controlled fertilizer plots have been set up for the purpose of comparing the germination of seeds, growth of plants, health of plants, relative resistance of diseases and insects, yield, and fertility of crops grown with various kinds of fertilizers. Send a contribution to Soil and Health Foundation, Emmaus, Pa., and become a member or renew your membership.

WITCHES-BROOM CONQUERED BY COMPOST BRICK MULCH

A story of two diseased trees at the Michigan Nut Nursery, Union City, Mich.

By HARRY P. BURGART

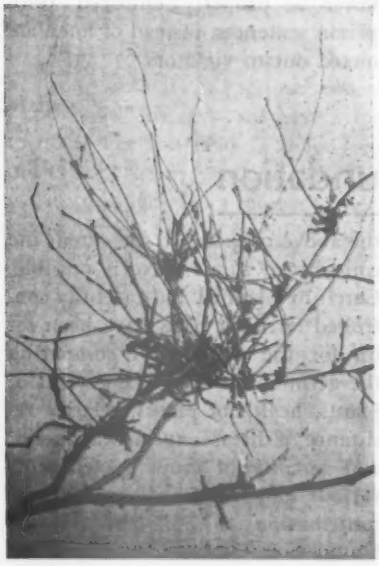
NOT too much is known about witches-broom, the new walnut disease that is worrying growers throughout the East and being quarantined against on the West Coast. Witches-broom has been recognized by growers for the past fifteen years. I have been growing nut trees for twenty-one years and have seen the disease kill trees that apparently were growing too fast or those that were undernourished. In the past, when I saw a tree developing the fine, stringy, growth of witches-broom I would just cut it down because they invariably would winter-kill during the following winter.

It seems that all trees of the genus Juglans such as the black walnut, the English walnut, the Japanese walnut and the butternut are subject to witches-broom when growing conditions are not properly balanced. Also I have seen the disease attack trees that were not grafted on congenial root-stocks, such as when the butternut was grafted on Japanese walnut root or vice versa. This goes to show that it does not pay to use just "any old rootstock" for a tree.

Usually my losses in nut trees were limited to smaller trees in the nursery, here and there. About four years ago I decided to work over a young black walnut tree near my garage to English walnut by grafting onto the limbs. Conditions were favorabic and the grafts took well. Being very much enthused with my work, I had my soil tested and found it needed phosphate. Super-phosphate was available so I scattered it around my tree to encourage growth from the grafts. It did; the grafts I had set during May made a growth of over three feet that summer.

My topworked English walnut tree started out nicely the next spring. Growth continued normal until about mid-summer. Then it happened! My tree started developing the fine, stringy, growth of witches-broom. That really made me feel "weak-in-the-knees" to see my favorite tree doomed to die! About that time two State Foresters stopped in and when I showed them the tree they shook their heads feeling sorry for me.

In desperation I thought of trying out some "Organic Methods" as a last resort to save my tree. I got busy right away and dug up the sod around the tree and carried it away. Then I decided to get a few wheelbarrow loads of the earthworm-infested compost that was left behind my packing house. This was spread several inches deep where I had removed the sod. Over the compost



Witches-Broom consists of a proliferation of branches caused by a fungus.

The little butternut that almost died but was saved by Compost-Brick Mulch.

Close-up showing the little 4 ft. tall butternut tree's nut clusters.

I wanted to place stones but was unable to find any around. Back of my garage I found a pile of bricks from an old chimney. Why not use them in place of the stones. First I brushed off as much dirt and soot as came off easily, then I painted them with white wash to make them look presentable.

By fall my English walnut tree did not look any worse nor did it look much better. My hopes were low when I took the bricks aside so I could put down a five-inch layer of oak and maple leaves, neighbors had been glad to get rid of. After the leaves were laid down I replaced the bricks on them to hold them from blowing away. Confidentially — I figured the tree as good as dead anyway, so never thought to take a picture of the witches-broom growth.

During the long Michigan winter that followed I would sit inside where it was warm and look out at my "sick" English walnut tree, figuring how I would go about cutting it down when spring arrived.

Spring finally did come around again and with it lots of work, so I only gave the tree a casual glance as I passed it. April was almost gone and my "sick" tree had not started growth yet. After a warm rain I went outside one morning to let my eyes rove over the buds of my tree and saw they were swelling and turning red. It was still alive! I rushed into the house to spread the good news.

That tree put out a vigorous but normal growth throughout the entire summer. The Organic System had saved my tree! Incredible! I could not help but talk "organics" to everyone who came that summer. Even now, three years later finds my English walnut tree thriving, without a trace of "witches-broom" in its top. This last spring it set six fine nuts—its first crop—and at this writing the nuts are as large as small apples. I am enclosing a snapshot of the tree taken a few days ago.

Even after all this had taken place I was still a little skeptical as to the value of the "Organic System" in curing witches-broom. My next opportunity for a test came after the English walnut had made full recovery. That spring I had grafted several rows of butternut trees in my nursery. All grew quite well until mid-July and then I noticed that one little graft was suddenly developing witches-broom. As a further check I decided to give it the same treatment "in a smaller way" as the English walnut tree had received earlier.

Magic again! That little butternut came through the winter with flying colors. Yes, it came out with a perfectly normal growth that spring and I decided to keep it for observation. It reached a height of four feet by fall and the following summer it bore three fine butternuts, while this summer that little butternut is going to mature 16 healthy butternuts. You will be able to see most of them in the photo sent herewith.

What the Compost-Brick Mulch did for me it should do for you, so keep on the alert for signs of witches-broom and try it out. Treatment should be started as early in the season as is possible.

The English walnut tree that had witches-broom as it appears today. Note how the bricks seem to be resting on the ground. The heavy leaf-mulch and compost placed under them last fall are gone. Bacteria—Earthworms.

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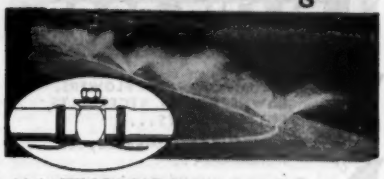

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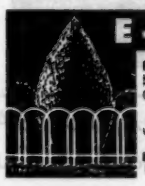

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THE EARTHWORM METHOD

By J. I. RODALE

IN THE study of the old method of making compost there were two main disadvantages. First, because of the earth bottom, much valuable liquid containing large amounts of valuable nutrients leached out from below. Secondly, because the materials were piled so high, five feet, a high heat decomposition took place. Such oxidation destroyed nutrients, bacteria and valuable enzymes. I believe I have worked out a method which will eliminate these disadvantages, without covering the top as in the enclosed method which excludes air.

The idea came to me from watching the boxes in which we breed earthworms. In these boxes in which the materials are never more than two feet high, I have never noticed any heating. One of the factors in preventing heating is that we thoroughly mix the various raw organic matters which go into these earthworm boxes. Secondly, the earthworms immediately penetrate into the matter working it up thoroughly. So there seems to be four factors in the way these boxes are constituted to prevent heating:

1. The raw matter is not more than 2 feet high.

2. There is thorough mixing of the raw material.

3. The presence of earthworms which begin to treat the material.

4. The fourth advantageous factor is, that in our case the boxes are tinned on the inside and bottom; thus no liquid is lost. So, the thought came to me to take these four points and to translate them into a method of making compost.

I visualize two set-ups. First the case where it is desired to make compost in a pit. Construct a pit of almost any width or length that is convenient. It can be of any shape—square, oblong, round. But the sides must not be more than two feet high. It would help if trees were planted to cut off the action of the sun because earthworms and composting in general thrive much better in the shade. Earthworms, in fact, prefer total darkness. Make a cement bottom and slope it gently so that liquids drain into a small wooden-covered pit. This kind of pit is used in the Selvi Method described on page 45 in the December 1949 issue of *Organic Gardening*. The sides of the pit can be of brick, building blocks or cement.

In this method a mixture of materials is placed in the pit and thoroughly mixed. The more it is mixed the less tendency there would be to heat up. See that the mass is well watered and put the earthworms in immediately. These should be of the domestic variety advertised in this magazine. The more earthworms that are put in the quicker the composting will take place. In a pit ten feet square it would be nothing to put in 10,000 earthworms. They breed very fast if you will start breeding them indoors. This method itself is practically a method of breeding earthworms which can be used for various pur-

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poses such as feeding to chickens, placing in a mass of raw organic matter, used as mulches, etc.

The action of the earthworms will produce the finest compost you can ever make. Their castings will thoroughly impregnate the mass with a material extremely rich in all the nutrients and trace mineral elements. It will become darker than compost made by other methods. As soon as the material is assembled and the earthworms placed in it, cover the entire top with rocks or old boards. Conditions of darkness will make the earthworms work better and the composting time will be greatly reduced. The rocks or boards will also conserve moisture. If the top is not covered the time element will be increased. Try to find flat stones that would be light to handle. The thinner type of purchased flagstones would be excellent for this purpose.

By this method compost can be made in two months or less, especially if bacteria activators such as ACTIVO or B.C.A. are used. In the old method where the heap was turned twice, the compost was supposed to be finished in three months although in many cases I found it to take much longer. Where we used earthworms in pits that were four feet high and did not turn the material it took six to eight months. If the material is ground first the composting time can be greatly reduced.

In the event of too much rain the excess water in this new method will go into the drainage pit and should be taken and used directly on top of mulches. It is a wonderful fertilizer. In the old method it is entirely lost unless the compost is made right in the vegetable garden.

Such a pit is an excellent place for the family garbage. Coffee grounds are excellent feed for earthworms. They seem to thrive on them. To enable the earthworms to make a better compost, buy some ground whole wheat and mix it in with the materials. You can use such other seeds, ground up, as soybeans, corn,

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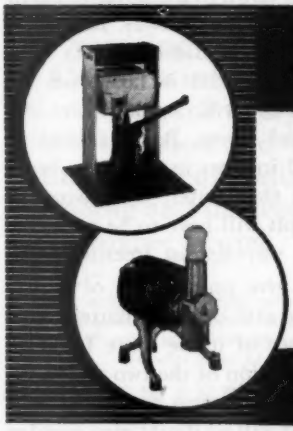

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etc. All of the grass clippings can go into this pit. I unhesitatingly recommend it as a method of manufacturing a high quality compost.

Where it is not desired to use earthworms be sure to cover the top of the mass with rocks which will exert a beneficial effect. You might also consider using only a small amount of earthworms. They will multiply enormously under these conditions. In the wintertime in a northern climate the earthworms should be taken out of the pit. There are several methods of doing it. One is by means of a sieve. The other is to peel off a layer of compost and by striking the top of the material the earthworms will work their way down to the bottom. Earthworms will move away fast when the surface is disturbed. As each layer of material is taken off the earthworms will work their way lower and lower. Boxes should be provided indoors in which to breed them in the winter. Otherwise the outside pit will have to be protected in some way against freezing.

Don't give up the idea of mulching with raw organic matter. The more I see of it the more I like it. A combination of the two methods—making earthworm compost and mulching will no doubt give wonderful results.

In assembling raw materials do not overlook the use of ground limestone, phosphate and potash rocks, although you have to be careful not to overdo them as the earthworms may be sensitive to an overdose. It would be best to put the rock powders in first, thoroughly wet it down and then put in the earthworms. I believe that the earthworms will kill weed seeds and there is some evidence that they kill disease organisms and larvae.

The Colloid Chemistry of the Silicate Minerals

THE COLLOID CHEMISTRY OF THE SILICATE MINERALS by C. Edmund Marshall (Academic Press, Inc., Publishers, New York, New York. 1949 $5.80).

This is Volume I of a series of monographs on Agronomy being prepared under the auspices of the American Society of Agronomy. Here is given for the first time a clear discussion of clay minerals. Separate chapters are devoted to the structure of silicates, the colloidal properties of zeolites, the size and shape of clay molecules, exchange reactions of clays, mechanical properties of clay suspensions, and other topics concerned with the colloid chemistry of the silicate minerals. Cloth bound, freely illustrated with photographs and line drawings, 195 pages.

Manual of Bacterial Diseases

MANUAL OF BACTERIAL DISEASES by W. J. Dowson (The Macmillan Company, 60 Fifth Avenue, New York 11, New York. 1950. $2.50)

Bacterial diseases which are causing severe losses to many crops in different parts of the world have not received such attention as have fungus diseases, virus diseases and insect pests. It is fitting, therefore, that this book which gives a comprehensive account of the bacterial diseases, the methods of investigation, the preparation of media, and the identification of bacterial plant pathogenes be called to the attention of our readers. All the known diseases in Britain and some confined to America are included. The diseases are illustrated with carefully chosen photographs. This manual should prove invaluable to all whose business it is to diagnose plant diseases. Cloth bound, illustrated with 40 Figs. and 18 maps.

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BOTANY—AN INTRODUCTION TO PLANT SCIENCE by W. W. Robbins and T. E. Weir (John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, New York. 1950 $5.00)

In preparing this general book on Botany, the authors have capitalized on the value of good illustrations. The text material is written and so designed to take full advantage of the carefully chosen illustrations. For ease of reading and for bringing illustration and description into the closest possible association, the two-column page is used. Special emphasis is given to recent discoveries in plant anatomy, photosynthesis, respiration, genetics, water relations, growth substances, chromosome structure, and many other aspects of plant science. Cloth bound with 480 pages, having 495 illustrations.

Western Land and Water Use

WESTERN LAND AND WATER USE by Mont H. Saunderson (University of Oklahoma Press, Norman, Oklahoma. 1950 $3.75)

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Front Porch Farmer

FRONT PORCH FARMER by Channing Cope (Turner E. Smith & Company, Atlanta, Georgia. 1949 $2.96)

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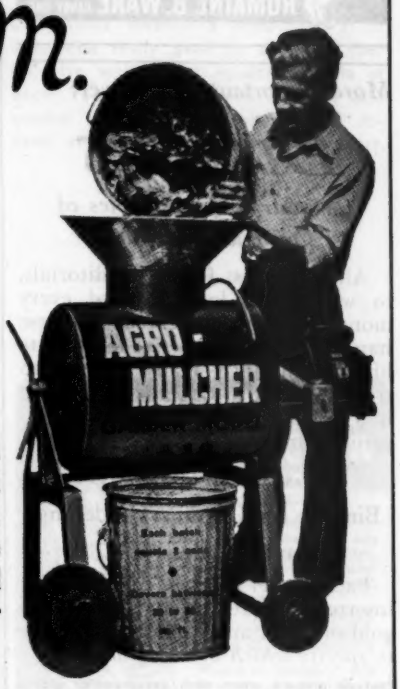

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Friend Sykes

(*Continued from page* 31)

and livestock were already showing the benefit of seven years of good husbandry, but all profits—and more besides—had been ploughed back. Now the accumulation of soil capital began to yield money dividends. Chantry was a farm again—a real, fertile farm.

In that same year, Sir Albert Howard paid the first of his many visits. He was not simply enthusiastic; he was thrilled. Here, he declared, was a living demonstration, right under the noses of sceptics, of all that he had been preaching. He saw to it that the light was no longer hidden under a bushel. Chantry became famous.

At his instigation, Friend Sykes snatched what time he could from farm and business to set down his experiences on paper. The result was *Humus and the Farmer* one of the most thought-provoking farming books ever written. It was brought out by the well-known London house of Faber and Faber in 1944, and has been published in the U. S. by Rodale Press. It is soon to be followed by a second book in which Friend Sykes will summarize his experiences with crop harvesting and conservation.

As a result of this publicity, Friend Sykes became a prophet as well as a pioneer. Other farmers began to visit Chantry, not singly or even in dozens, but in large organized parties; in 1947 there were 2,000 visitors. His lectures in different centers (20 to 30 each winter) became sure draws; his services as adviser were eagerly sought. Thanks to his professional work as a land-valuer, he has a first-hand knowledge of farming conditions in different parts of the country and is now agricultural consultant to 30 estates, comprising 50,000 acres. Wherever he goes, he propagates organic methods and is himself a living testimony to their value as the highroad to health; for the physical endurance imparted by organically-grown foods enables him at sixty years of age to stand up to constant speaking and traveling—nearly 1000 miles a week, driving his own car.

Naturally he has many critics, since he is as forthright as Sir Albert was himself, and makes challenges as readily as he accepts them. But he commands respect among practical men, for back of him lie 750 acres of once-derelict land won back to high fertility, and on them some hundreds of healthy, thriving livestock. As a man of business, he has proved to his own satisfaction that organic farming pays.

"I am humus-farming," he says, "because, after more than forty years on the land, I am satisfied that there is more profit in it than in the use of artificial fertilizers. Farming is essentially a long-term policy, and if I would farm at a profit, I must see to it that I have some land to farm in the long years ahead. The indiscriminate use of artificial fertilizers, while providing a profit for the moment, will diminish my future period of farming and, in my experience, consists of nothing more than the transfer of money from capital to current account. Humus provides me with all the opportunities for profit that I can ever hope for."

Fertilization by Bees Increases Clover Seed More Than Fourfold

(*From Crops & Soils, March* 1949 *issue.*)

Experimental work in Ohio indicates that eight times the average yield of red clover seed is possible when full fertilization of clover is obtained by bees. In the Ohio trials, from four to six colonies of bees per acre proved adequate.

. It would be practical to produce four bushels of red clover seed per acre. They also say that the production of alsike clover seed in Ohio could be raised from 1.6 bushels to 12 bushels per acre.

Seminar on Potassium

(*Continued from page 21*)

Kentucky Blue Grass hay	2.0
Timothy hay	1.4
Red clover hay	2.1
Cow pea hay	2.8
Soybean hay	1.2 to 2.3
Salt hay	0.6
Pea forage	1.4
Winter rye	1.0
Immature Grass	1.2
Garden Pea Vines	0.7
Weeds	0.7
Leaves	
Apple leaves	0.4
Peach leaves	0.6
Pear leaves	0.4
Cherry leaves	0.7
Raspberry leaves	0.6
Grape leaves	0.4
Oak leaves	0.2
Straw	
Millet	3.2
Buckwheat	2.0
Oats	1.5
Barley	1.0
Rye	1.0
Sorghum	1.0
Wheat	0.8
Corn Stover	0.8
Manure	
Cow (fresh manure)	0.1
(dried manure)	1.5
(fresh urine)	0.5
Horse (fresh manure	0.3
(dried manure)	1.6
(fresh urine)	1.5
Hog (fresh manure)	0.5
(fresh urine)	0.8
Goat and Sheep (fresh manure)	0.3
(dried manure)	3.0
(fresh urine)	2.3
Chicken (fresh manure)	0.6 to 1.0
(dried manure)	1.2
Pigeon (fresh manure)	1.0
Duck (fresh manure)	0.6
Goose (fresh manure)	0.6
Dog (fresh manure)	0.3
Ashed Material	
Banana residues (ash)	41.0 to 50.0
Pea pods (ash)	27.0
Cantaloupe rinds (ash)	12.0

Permanent Mulch

Q. Is it best to keep the ground covered with an organic mulch at all times, when conditions make this practicable?

E. L., Middlebury, Conn.

A. Nature abhors a naked soil as much as she abhors a vacuum. Under natural conditions, nature maintains a permanent ground cover and a continuous mulch of plant residues which absorbs the rain, protects the soil from direct sunlight, conserves the moisture in the soil, and serves as food for the organisms in the soil.

Should Green Matter Be Plowed Under

Q. Should green matter be plowed under, or should it be cut close to the ground and allowed to decompose for a time on top of the soil? Is not the natural method that of breakdown above the ground?

D. L., Middlebury, Conn.

A. Under natural conditions, plant residues are deposited on the surface of the soil, and decomposition takes place at the interface between the layer of organic matter and the soil's surface. Under these conditions, air is abundantly available and aerobic decomposition takes place at a rapid

(*Continued on page 57*)

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How To Get More Out of the Garden

(*Continued from page 18*)

TABLE I
FOLLOW-UP CROPS

Vegetable	Variety Recommended	Days to Maturity	Make Last Sowing*
Beans	Bountiful (green)	50-55	July 20
	Yellow Bountiful (wax)	50-55	July 20
Beets	Detroit Dark Red	60-70	Aug. 10
	Winter Keeper (for Storing)	80-90	July 20
Carrots	Nantes Half-long (coreless)	70-75	Aug. 1
	Tenderaweet (long)	75-80	July 25
Celery (plants)	Golden Self-Blanching	115-120	July 10
Corn	Golden Cross Bantam	85-90	July 1
Cucumber	Straight Eight	60-65	July 25
Kohlrabi	Early White Vienna	55-60	Aug. 1
Lettuce	Grand Rapids	45-50	Aug. 5
	White Boston	80-85	July 15
Radishes	Comet	25-30	Aug. 15
Tomatoes (plants)	Rutgers (red)	75-80	July 10
	Jubilee (yellow)	75-80	July 10

placed. If the second crop consists of small plants such as cabbage, tomato, etc., pull the mulch back around the plants after they have been set. If seeds have been planted, it will be best to let the mulch lay to one side until the seeds have germinated and grown somewhat. Then, pull the mulch back in place around the young plants. Under no circumstances should the mulch be worked into the soil after the first crop has been harvested and before the second crop is planted.

When to Plant Succession Crops

Most succession crops can be sown any time, though not all do equally well at all times. Lettuce and mustard, for instance, are quite likely to bolt to seed quickly in hot weather, making it rather risky to sow them between early June and mid-August in sections where July and August are likely to be very hot and dry. Plants from seeds sown in late August will, however, get increasingly cooler weather as they approach maturity, and therefore stand a good chance of producing a worth while crop. The same is true, to an even greater extent, for peas.

It is important with succession crops that are susceptible to hot, dry weather, that the later they can be sown the better, provided sufficient time is allowed for them to reach maturity before frost puts an end to their growth. For this reason, early varieties should be selected for late sowings.

In some cases, the successions may extend over parts of two years, as when strawberries are followed by late potatoes or cabbages. In this case the strawberries are set the year before the succession-crop is grown. A crop of rhubarb or asparagus may be followed, when the crop is finally turned under, by a short-season crop, thereby allowing the cutting of the asparagus or rhubarb in its last season. If a perennial crop is used in a succession program, it is usually thought best to follow it with an annual.

TABLE II
CROPS FOR FALL AND WINTER USE

Vegetable	Variety Recommended	Days to Maturity	Plant Not Later Than*
Brussels Sprouts	Long Island Improved	120-125	July 1
Broccoli	Italian Green Sprouting	80-85	July 20
Cabbage	Danish Ballhead	105-115	July 20
Cauliflower (all plants)	Super Snowball	85-95	July 15
Chinese cabbage	Chihli	75-80	July 15
Peas	Little Marvel (dwarf)	65-70	July 20
	Alderman (tall)	75-80	July 5
Rutabagas	Purple-top Yellow	90-100	July 1
Turnips	Purple-top White	55-60	Aug. 1
Spinach	Nobel	50-55	Aug. 15
Winter Radish	Chinese Rose	55-60	Aug. 10

* Dates for planting in these two tables are for normal growing seasons in climatic regions similar to that of New York, Cleveland, and Kansas City.

Garden Calendar

(Continued from page 39)

kohlrabi. Tampala, both green and red, thrives in summer heat, and is an excellent substitute for chard and spinach. Grow your cucumbers on trellises to save room. Use the Syrian or Herta and the Chinese climbing one. By giving your lettuce a little shade, you can have fine lettuce all summer. Use Slobolt, Oak Leaf and Bibb for quick results. July is one of the earliest months to get started on your early winter vegetables, onions, cabbage, cauliflower, broccoli, etc. Use seed-beds for all your propagating. Keep your plants growing actively and by the first of September, the beginning of our "Second Spring," they can be transplanted into rows prepared for them. Many gardeners like to grow a second crop of potatoes. July 20 is a good date to start planting on well-irrigated ground. Be sure your herb-bed is giving you its full quota of herbs for your summer salad bowl and your seasoning of all the delectable dishes for the hot summer weather.

*The Lower South***

Flower Garden:—Plant gaillardia, globe amaranth, ornamental sunflower, portulaca, verbena, periwinkle, zinnia. During this hot month give special attention to the roses, if they have not already been taken care of earlier in the summer. Fertilize and cover with a heavy mulch to keep them blooming.

Vegetable Garden:—Unlike the northern gardens, Florida plantings are few in July, and gardeners are busy harvesting rather than planting. A few things are appropriate, such as: celery, collard, eggplant, mustard, okra, pepper, New Zealand spinach, turnip. While calendars are convenient guides, it is sometimes worth while for the gardener to try something not recommended, as the various conditions of local soils and climate make it possible for one man to raise things in his section, that another cannot. Also there is the matter of the "green thumb," which some are said to have and others not. Those from other States who settle in Florida have a great deal to learn about gardening here. Some years ago a neighbor who had been in Florida a long time was asked why sweet potatoes were planted on high ridges. "I don't know," was the reply. "Other people do it, so I do it." Another man who raises quite a crop of this good food was asked when to plant, with the suggestion that perhaps any season would do. No, he always planted in May. His questioner, this spring, in March, was harvesting a good crop from vines set out the previous October—five months before the other's planting time. He also discovered that there were still other months in which to start this crop. There was the slight chance of fall vines being damaged by frost, but this does not necessarily occur. The home gardener can often take chances that a large commercial grower would not be warranted in taking.

Trees and Shrubs:—If fruit trees are not already protected by mulch it will be worth while to supply it in some form in order to conserve moisture and to provide material for the formation of humus as it breaks down. If there is a choice, avoid the vegetation with a large quantity of seeds, which are better disposed of in the compost heap. Leaves, water hyacinths, and vines from the garden are good. The above also applies to shrubs of various kinds.

** Edwin H. Abrams, St. Cloud, Florida

Readers' Correspondence

(Continued from page 55)

rate. Favorable conditions of moisture and temperature are also important.

If green matter is plowed under, it should be plowed under only lightly and time should be allowed for the decomposition of the raw organic matter before a crop of growing plants is started in the soil.

(Continued on page 60)

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HINTS for the FLOWER GARDEN

Evergreen Tips

Midsummer is the time of year that the Red Spider mite will cause the most injuries to evergreen trees. Browning of the evergreen leaves is a good indication that this mite is at work, and it would be a good idea to check all your evergreens. This mite is so small that it is hard to see with the naked eye. These mites seem to run in cycles of three years, for every third year they are about three times as numerous as the two preceding years.

A remedy for getting rid of this mite is to spray the trees with a garden hose and water. This method has been found to be the most effective and least damaging to evergreen trees. When washing down the tree, it is best to start at the top and come down, making sure to wash the under sides of the leaves. It takes about fifteen minutes to wash a tree six feet high, and do a good job on it.

Hurrying the Hardy Amaryllis

In climates similar to Northwest Missouri and Southwest Iowa, gardeners can, under normal conditions, count on blossoms on the Hardy Amaryllis (*Lycoris squamigera*) about the middle of August. It is possible to hurry them along a week or two sooner by watering the row thoroughly about two weeks before the blossoms are wanted. The ground must be soaked thoroughly twice a week and a mulch applied to conserve the moisture. The bud stem may be cut as soon as the first pinky-lavender blossom is about ready to open. All the buds will open after being cut.

Propagating Roses

Many of the climbing roses are grown from their own roots and can be propagated from cuttings. Some may be propagated by laying down the canes which are near the ground and covering them with soil.

Bachelor Buttons

Bachelor buttons which have finished their first blooming period may often be made to flower again by cutting at least six inches from the tops of the plants, then fertilizing with a liquid manure.

Poppies

Oriental poppies will have become dormant by late July and may be successfully divided. Roots may be cut into two inch pieces and planted in moist soil.

Pruning Roses

Most climbing roses are best pruned as soon as they have finished blooming. Those which bloom on laterals need not be pruned until later in the season when only the old lateral branches are removed. Those which send up new canes from these roots should have most of the old canes removed.

Lift Your Tulip Bulbs

Tulip bulbs may be lifted early this month, dried well in the shade, and then stored away in a dry cellar.

Rambler Roses

Baby rambler roses (*polyantha*) will flower all summer if the old flower clusters are snipped off regularly.

Delphinium

Fresh delphinium seed germinate best, so for good results sow the seed as soon as obtained.

Cutting Gladiolus

When gladiolus spikes are being cut for decorating the house, enough foliage should be left to enable the corms to ripen properly. It is best to use a sharp knife and make a slanting cut on the stem.

Summer Pruning

Snow-in-summer, *Cerastium tomentorum*, should be pruned hard at this season, especially in the rock garden as it makes very rapid growth.

Wisterias may be pruned during July and are benefited by much harder trimming than is usually given them.

Leaf Cuttings

Pieces of leaves of some begonias and snake plant can be successfully rooted in sand.

Gasplant

Did you know GASPLANT was so-called because it gives off an inflammable vapor?

Lilacs And The Farm

Lilacs are one of the best flowering shrubs for farms. They will bloom for generations with very little care, and get more beautiful with the years.

Watering Gladiolus

Keep gladiolus plants well watered when they are coming into bud so they will not wilt on hot days and have crooked stems.

House Plant Holiday

Bury your house plants in the garden for their summer holiday. Sink the pot to one-half inch of rim in light shade. This keeps the roots in and aids drainage. If roots tend to roam in surrounding soil, they can be checked by giving the pot a twist from time to time.

Green Beans

It is not too late to sow six-weeks beans for a Fall crop of green beans.

Tieing

Really soft string is much better for plant tieing than the hard, twisted kinds which may easily injure tender bark or stems.

Dust Mulch

A dust mulch may be produced by frequent cultivation which prevents loss of moisture and also kills weeds which rob the crops of their food.

Late Seeding

Large seeds (peas, beans, etc) will sprout well if, after tramping the rows firmly, you cover them with loosely raked soil to serve as a mulch.

Protect Your Tomato Plants

Here is a way to keep dogs out of your tomato plants and make picking a lot easier.

Take about four feet of any wire garden fence and roll this in a cylinder, twisting the ends together. Put this cylinder over tomato plants. This cylinder will keep tomatoes off the ground and up where they can be picked much easier. It is essential to get a wire with a mesh large enough to get your hand in and the tomato out.

Control of Wireworms

Wireworms may be trapped by impaling pieces of carrot or potato on thin sticks and burying the bait two or three inches under the surface of the soil. The baits, located by the sticks, should be examined daily and the larvae congregated on them destroyed.

Easier Hoeing

When using an ordinary hoe, one invariably bends his back. There is no necessity for doing so, but somehow, nearly everyone does it. With a scuffle hoe, this tendency is entirely obviated. You can push or pull a scuffle-hoe all day without getting a backache.

Substitute

Chinese cabbage may be sown at this time. It makes a good substitute for lettuce, which is difficult to grow in hot weather.

Tomato Scald

Where tomatoes are subject to sun scald, pick them as they start to turn color, and let them ripen in the shade.

Weed-Free Driveways

Liberal quantities of powdered borax will kill off vegetation. If borax is used in the driveway, it will keep out the weeds completely all summer. Apply it in the spring as soon as the weeds show.

Use one pound of powdered borax to every twenty square feet of driveway. The borax may be broadcast by hand, using a rubber glove to protect the hands. After the powdered borax has been broadcast, wet it down with the garden hose, using a fine spray so as not to wash it all away from one spot. If you have missed any places in the driveway, go over it again where you missed the spots.

Late Planting

Keep in mind that the soil must be well firmed under the roots of late cabbage and cauliflower plants set out at this time.

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Readers' Correspondence

(*Continued from page 57*)

While the raw organic matter is being decomposed, the available plant nutrients in the soil will be used by the organisms of decomposition and will not be at the disposal of the crop plants until the soil organisms have converted the raw plant materials into compost.

Commercial Fertilisers

Q. Is there any place in the organic method where commercial fertilizers fit in? Can they not be used to make up for certain soil deficiencies? If so, what is the proper method of using them?

P. L. Middlebury, Conn.

A. There is no place for commercial fertilizers in the organic method, because they are injurious to a living soil. As a rule, a fragment of such fertilizers cannot be used by plants and thus accumulates in the soil. Common unusable fertilizer fragments are sodium, chlorine, and sulphuric acid. These fragments cause undesirable changes in the soil as hardness, acidity, and sterility.

Soil deficiencies can be supplied by suitable applications of such natural products as pulverized phosphate rock, powdered potash rock, seaweed, or almost any plant and animal residues.

Planting Seeds In Fall

Q. Would you care to comment on the subject of planting seeds in the fall?

E. L. Waterbury, Conn.

A. The seeds of so-called hardy plants may well be planted in fall. Seeds of biennial and perennial plants should be planted early enough to insure germination and an early seedling growth before winter dormancy. The seeds of hardy annuals should be planted late so that the seeds will remain dormant until conditions favorable for germination the following spring are reestablished. In any case, fall planting of seeds succeeds to the extent that the soil contains organic matter and has a winter protection of mulch.

No Digging

Q. Under what conditions is it proper not to stir up or agitate the soil any more than is absolutely necessary? For example, I have heard it said that the best way to garden is to keep a permanent mulch, to cut off the weeds with a sharp hoe and let them lie where they fall, and when planting to simply part the mulch, put in the seed, and cover them again—no cultivation of the soil at all.

E. G. Middlebury, Conn.

A. This is nature's method as one witnesses it in the forest, meadow, and prairie. To the extent that it is practical, it is good. Sufficient mulch must be kept on the soil to keep it soft and friable. The no-digging method presupposes a sufficient mulch on the soil.

Closed Pit for Manure

Q. How is one to remove the manure from the "silo" after it has cured? (By the Italian method.)

Dr. E. R. W., Elkader, Iowa

A. The silo should be constructed in such a way that the composted manure can be removed from the bottom. For this purpose, there must be a suitable opening at or near the bottom of the pit. Except when compost is being removed, this opening is kept closed by a suitable door.

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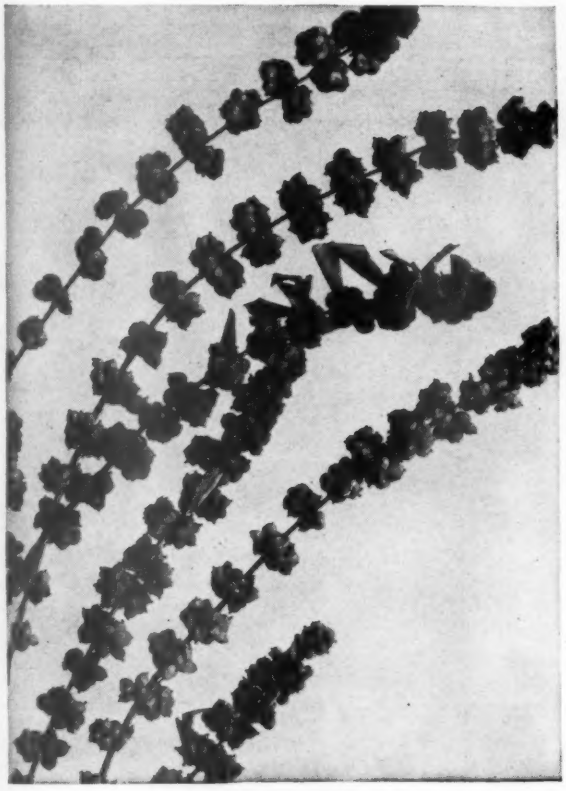

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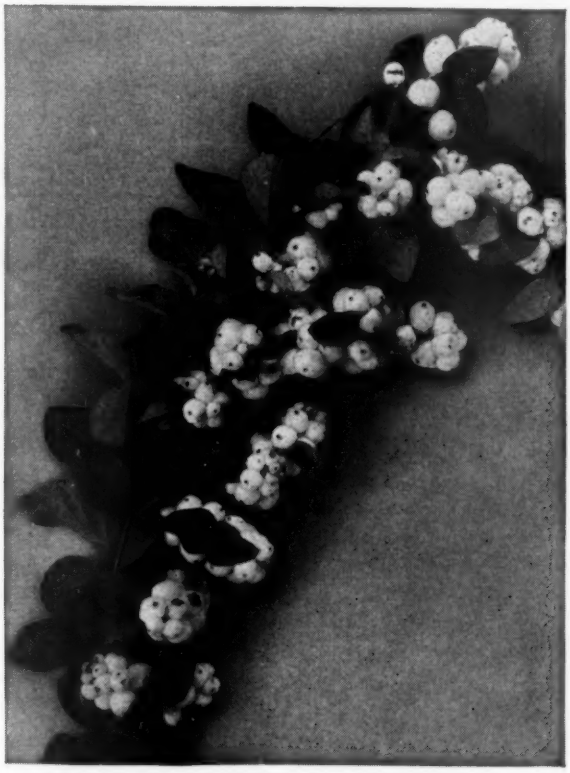

Symphoricarpus albus laevigatus
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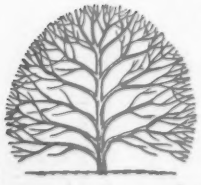

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